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J. W. POWELL, DIRECTOR

THE

MESOZOIC ECHINODERMATA

OF THE

UNITED STATES

BY

WILLIAM BULLOCK CLARK

WASHINGTON
GOVERNMENT PRINTING OFFICE
1893

CONTENTS.

Page.
Letter of transmittal 9
Preface 11
Introduction 13
Bibliography 15
Systematic review 21
    Crinoidea 21
        Uintacrinidæ 21
        Apiocrinidæ 24
        Pentacrinidæ 25
    Asteroidea 29
        Ophiuridæ 29
        Stelleridæ 31
    Echinoidea 33
      Euechinoidea 33
        Regulares 33
          Cidaridæ 33
          Salenidæ 40
          Diadematidæ 44
          Echinidæ 54
        Irregulares 58
          Echinoconidæ 58
          Cassidulidæ 59
          Holasteridæ 74
          Spatangidæ 78
    Doubtful and unrecognized species 92
Geological distribution 94
Catalogue of specific names employed by writers upon the Mesozoic Echinodermata of the United States 95
Plates 103
Index 205

ILLUSTRATIONS.

Page.
Plate I. Uintacrinus socialis Grinnell 106
II. Uintacrinus socialis Grinnell 108
III. Bourgueticrinus alabamensis de Loriol; Pentacrinus asteriscus Meek & Hayden; Pentacrinus Bryani Gabb; Pentacrinus Whitei Clark 110
IV. Ophioglypha bridgerensis (Meek); Ophioglypha texana Clark. 112
V. Goniaster mammillata Gabb; Asterias dubium Whitfield...... 114
VI. Cidaris taylorensis Clark; Cidaris californicus Clark; Cidaris splendens Morton; Cidaris Walcotti Clark................... 116
VII. Cidaris texanus Clark; Leiocidaris hemigranosus (Shumard).. 118
VIII. Leiocidaris hemigranosus (Shumard) 120
IX. Leiocidaris hemigranosus (Shumard) 122
X. Salenia texana Credner 124
XI. Salenia tumidula Clark; Salenia bellula Clark.................. 126
XII. Hemicidaris intumescens Clark; Pseudodiadema Emersoni Clark........................ 128
XIII. Pseudodiadema diatretum (Morton); Pseudodiadema texanum (Roemer) 130
XIV. Pseudodiadema texanum (Roemer) 132
XV. Diplopodia texanum (Roemer) 134
XVI. Diplopodia texanum (Roemer); Diplopodia Hilli Clark 136
XVII. Coptosoma Mortoni (de Loriol)........................ 138
XVIII. Coptosoma speciosum Clark; Goniopygus Zitteli Clark....... 140
XIX. Goniopygus Zitteli Clark 142
XX. Psammechinus cingulatus Clark........................ 144
XXI. Pedinopsis Pondi Clark 146
XXII. Pedinopsis Pondi Clark 148
XXIII. Stomechinus Hyatti Clark; Holectypus planatus Roemer..... 150
XXIV. Pyrina Parryi Hall........................ 152
XXV. Botriopygus alabamensis Clark 154
XXVI. Echinobrissus expansus Clark; Echinobrissus texanus Clark.. 156
XXVII. Trematopygus crucifer (Morton); Catopygus oviformis Conrad; Catopygus pusillus Clark 158
XXVIII. Cassidulus florealis (Morton)........................ 160
XXIX. Cassidulus æquoreus Morton 162
XXX. Cassidulus micrococcus Gabb 164
XXXI. Cassidulus subquadratus Conrad 166
XXXII. Cassidulus subconicus Clark 168
XXXIII. Cassidulus porrectus Clark........................ 170
XXXIV. Cassidulus porrectus Clark........................ 172
XXXV. Cassidulus porrectus Clark; Cassidulus Stantoni Clark....... 174
XXXVI. Ananchytes ovalis Clark 176

Page.
Plate XXXVII. Cardiaster cinctus (Morton) 178
XXXVIII. Holaster simplex Shumard 180
XXXIX. Holaster simplex Shumard; Enallaster texanus (Roemer)... 182
XL. Enallaster obliquatus Clark 184
XLI. Epiaster elegans (Shumard) 186
XLII. Epiaster elegans (Shumard) 188
XLIII. Epiaster elegans (Shumard); Epiaster Whitei Clark 190
XLIV. Epiaster Whitei Clark 192
XLV. Hemiaster parastatus (Morton) 194
XLVI. Hemiaster stella (Morton); Hemiaster ungula (Morton) 196
XLVII. Hemiaster texanus Roemer 198
XLVIII. Hemiaster Humphreysanus Meek and Hayden; Hemiaster Dalli Clark 200
XLIX. Hemiaster californicus Clark; Hemiaster Calvini Clark..... 202
L. Linthia tumidula Clark 204

LETTER OF TRANSMITTAL.

Department of the Interior,
United States Geological Survey,
Division of Mesozoic Invertebrates,
Washington, D. C., October 15, 1891.

Sir: I herewith transmit the manuscript of a memoir on the Mesozoic Echinodermata of the United States by Dr. William B. Clark, which you authorized him to prepare as a part of the work of the division of the Survey in my charge. I recommend that it be published as a bulletin of the Survey.

Very respectfully,

C. A. White,
Geologist in charge.

Hon. J. W. Powell,
Director U. S. Geological Survey.

PREFACE.

The present bulletin on the Mesozoic Echinodermata of the United States is the first of a series of reports on American fossil radiates. The material for a review of the Cenozoic Echinodermata has already been collected, and the results of that work will be shortly added.

The investigation of the Mesozoic Echinodermata, first undertaken at the request of Dr. C. A. White, was intended to include only the material in the possession of the U. S. National Museum, but the necessity for wider comparisons and a general treatment of American species became apparent as the work advanced. The larger collections in other institutions were accordingly drawn upon, and as a result the number of new forms has been greatly increased, while misconceptions that have hitherto existed as to the limitations of many of the earlier species have been rectified.

Much poor material that indicates other and new species has been ignored in this review, so that further collections will doubtless largely increase the number of American forms.

The writer is under great indebtedness to Prof. Robert T. Hill for information in regard to the geological range and localities of many of the Texan species and for the loan of a large amount of material. Further, the writer desires to extend his thanks to Prof. Angelo Heilprin, of the Academy of Natural Sciences of Philadelphia, Prof. R. P. Whitfield, of the American Museum of Natural History, New York, Prof. Alpheus Hyatt, of Boston, Prof. O. C. Marsh, of New Haven, Mr. G. Wolf Holstein, of Texas, Dr. G. Hambach, of St. Louis, Prof. Samuel Calvin, of the University of Iowa, Mr. E. T. Dumble, State Geologist of Texas, Mr. E. J. Pond, of Washington, Mr. F. A. Sampson, of Sedalia, Missouri, and others, for the opportunity to use the important collections in their possession.

The writer is under the greatest obligations to Mr. C. R. Keyes, who has executed the very complete and accurate series of structural drawings, and whose extensive knowledge of the Echinodermata gives to the other illustrations prepared by him an especial value for determinative purposes. The author is also indebted to Mr. H. C. Hunter for the care he has shown in the preparation of the drawings intrusted to him.

THE MESOZOIC ECHINODERMATA OF THE UNITED STATES.

BY WILLIAM BULLOCK CLARK.

INTRODUCTION.

The need of a revision of American systematic paleontology is nowhere more apparent than in the subkingdom of the Echinodermata. The valuable contributions of Wachsmuth and Springer upon the Paleozoic Crinoidea have largely covered the field for that division, while as yet nothing exhaustive has been attempted for the Mesozoic and Cenozoic. The value of the Echinodermata in the later horizons may not be so great as in the earlier, yet many important forms of wide geological and geographical range are found in both the Mesozoic and Cenozoic.

The reports of Morton upon Atlantic Coast species and of Roemer and Shumard upon Texan types are among the most important publications upon North American Mesozoic Echinodermata, but the articles are in each case difficult of access to the student and the results recorded wholly inadequate for present systematic or stratigraphical requirements.

In previous discussions of North American Echinodermata no attention has been paid to the South American forms, so that much confusion exists as to the true relations of the two faunas. Very little is known of the geographical range of the various species, but that many of the North and South American forms described under different names are identical is beyond doubt. When more exhaustive collections have been made and comparisons instituted, this similarity of echinoderm faunas in the two continents will be made apparent. The present poor descriptions and meager figures afford a very inadequate basis for such a study.

The identity of American with European species seems doubtful, although a few forms present characters that closely ally them.

In the succeeding pages is presented a complete bibliography of works on North American Mesozoic Echinodermata, and of certain others that deal with closely related forms.

In the systematic review that follows, and that constitutes the major portion of the report, descriptions of moderate length are accorded the different species. It has been deemed sufficient to present simply those characteristics that are necessary for an accurate determination of the forms, omitting many of the minute though interesting details of structure. A table is given showing the geological range of the different American Mesozoic species. In conclusion an index to the various terms employed by those who have written on the Mesozoic Echinodermata of the United States is presented.

An attempt has been made to very fully illustrate all the species. Many of the details of structure, not recorded in the descriptive portions of the report, are shown on the various figures.

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SYSTEMATIC REVIEW.

CRINOIDEA.

UINTACRINIDÆ.[1]

Calyx unsymmetrical, without column. Basis monocyclic. Basals five, inclosing a centro-dorsal plate. Radials 5×3. Interradials numerous, the lowest between the second radials. Arms 5×2, very long, with pinnules.

UINTACRINUS Grinnell.

UINTACRINUS SOCIALIS Grinnell.

Plate I, Figs. 1a–c; Plate II, Figs. 1a–e.

Uintacrinus socialis Grinnell, 1876. Amer. Jour. Sci., 3d ser., vol. 12, pp. 81–83, Pl. IV, Figs. 1–2b.

Uintacrinus socialis Meek, 1876. U. S. Geol. and Geog. Survey of the Territories, Bull. vol. 2, pp. 375–378, Figs. A–B.

Determinative characters.—Calyx subglobose, composed of numerous thin, slightly convex plates, joined together by channeled sutures and without distinct surface markings. Column wanting. Basis composed of a small pentagonal centro-dorsal plate, surrounded by a circle of five small similar basals. Encircling the pentagonal base and alternating with the basals are five large radials, hexagonal in outline and wider than high. Succeeding the primary radials are secondary and tertiary radials, the latter axillary in form. The primary radials alone are in contact, the others being separated by interradials. Succeeding the radials are several distichals, which gradually change to true rounded brachials, forming ten long arms. Between the distichals are two large interdistichals, situated one above the other. From the second distichal, which is axillary in form, a row of plates diverges interradially, alternating with similar plates from the same distichal of the adjacent area. From the fourth distichal a like row of plates diverges radially, alternating with similar plates from the same distichal of the other half of the same area. Higher up other rows diverge both radially and interradially until true pinnules are developed on the free brachials. The brachials are united either by articulation or sizygial suture, in the latter case the line of union often becoming obliterated. The interradial plates, eight or nine in number, form a rounded, slightly elevated shield-like area, surrounded above by the alternating rows of plates that diverge from the second distichal.

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[1] The family of the Uintacrinidæ, as characterized by von Zittel in his "Handbuch der Paleontologie," includes only two species, *Uintacrinus socialis* Grinnell, from the Cretaceous of Utah and Kansas, and *U. westfalicus* Schlüter from the Cretaceous of Westfalia. The genera Uintacrinus and Marsupites alone among Mesozoic types afford points for comparison with the Paleozoic crinoids. Neumayr in "Die Stämme des Thierreiches" considers the difficulty of bringing them into a consistent classification with the other crinoids but suggests several points of relationship between Uintacrinus and the Ichthyocrinidæ.

Dimensions.—Calyx: height, 2 inches; breadth, 2¼ inches. Arms: length, 20 inches (?).

Description.—The first specimen of this species was collected by Prof. O. C. Marsh in 1870 from the Cretaceous of the Uinta Mountains of Utah and by him compared with Marsupites of the English chalk.[1] Subsequently other specimens were obtained from Kansas, and in 1876 were described by Mr. G. B. Grinnell, an assistant to Prof. Marsh at that time, under the name of *Uintacrinus socialis.* Prof. F. B. Meek, who had already in his possession similar material, added, in the Bulletin of the U. S. Geological and Geographical Survey of the Terrtories, descriptions of certain points in the structure not mentioned by Grinnell.

All the specimens hitherto collected are much compressed, so that the original form is with difficulty determined. In general, on any single specimen only the plates of one side are preserved sufficiently well for identification.

The calyx is subglobose, with ten long, simple arms extending from the upper side (Pl. I, Fig. 1*b*). The plates are thin, slightly convex, and joined together by simple, though well marked, sutures, that are generally slightly channeled. The calyx is without column or stalk, and belongs to the class of "free" forms.

The basis is composed of a centro-dorsal plate, surrounded by five basals. The centro-dorsal plate is doubtfully visible upon only a single specimen. Judging from the problematical portion of the plate exposed, and the shape of the lower edges of the basals, it must be small and pentagonal in form. Its presence was not noted by either Grinnell or Meek, upon the specimens examined by them. The five basals, also undescribed by previous writers, encircle the centro-dorsal plate (Pl. II, Figs. 1*a*, 1*b*). They rest with one side against the latter and terminate in a sharp angle above. The whole basis forms a nearly perfect pentagon, which is slightly depressed where the line of juncture of two adjacent basals reaches the edge. Five large primary radials surround the basals and alternate with them. They are six or seven sided, the latter occurring when the edge toward the basis is broken by an angle into two portions. These plates are wider than high, and come in contact with one another only in the lower portion of each side. The upper parts are separated by the interradial area, as are the secondary and tertiary radials that succeed the primary. The secondary radials are smaller than the primary, and are separated by horizontal suture lines from them. The tertiary radials are axillary, bearing two large distichals that come in contact only along a portion of their lateral margins (Pl. I, Fig. 1*c*). Succeeding the primary distichals are four others of large size and varying shape, beyond which the plates rapidly decrease in size and change to true brachials (Pl. I, Fig. 1*c*).

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[1] Amer. Jour. Sci., 3d ser., vol. 1, 1871, p. 195.

In the angle between the larger distichals of each radial series are two large interdistichal plates. The lower of these comes in contact with the primary distichals in the angle formed by the upper portions of the lateral margins of those plates. It likewise touches the sides of the second and a portion of the third distichal. The upper interdistichal rests with horizontal edge upon the lower, and is embraced between the upper portion of the third distichals and the lower portion of the fourth, ending above with angular margin between the modified plates that branch from the fourth distichals, to be presently referred to.

The second distichals are axillary and support interradially rows of plates, the first of each row separated from one another by the interradials (Pl. I, Fig. 1*a*). The first plates are smaller than the second of the same row, which meet with a vertical suture and slightly overlap, a character which becomes more pronounced higher in the series, so that true alternation results. Beyond the third plate a rapid reduction in size of plates takes place. Ten to twelve plates have been recognized in each row.

From the fourth distichals, which are likewise axillary, similar rows diverge radially (Pl. I, Fig. 1*c*). From the fifth distichals are other rows interradial in position, while the seventh again bear radial branches. These rows gradually grow smaller and as the brachials become movable appear as pinnules. The lower rows become incorporated in the calyx, and as they are immovable have become modified for the position they occupy.

The interradials are eight, nine, or more in number and form an elevated, shield-like area, each plate likewise showing a slightly convex surface (Pl. I, Fig. 1*a*). The arrangement of the plates does not vary; seven in an oval band inclose the eighth, or eighth and ninth, according to the number of interradials. The lower interradial occupies the angle between the upper portions of the lateral margins of the primary radials and likewise separates the secondary radials. The two upper interradials occupy the angle formed by the branches from the second distichals and the distichals themselves. The four other interradials of the outer band lie two on each side between the lower interradial and the upper pair of plates. The lower two of these four are in contact, while the upper two are separated by the inner plate or plates. In contact with the four plates are the secondary and tertiary radials and the first and second distichals. The inner plate is more frequently replaced by two smaller ones irregular in outline and position.

The brachial plates are the continuation of the distichals and form ten simple arms. They gradually assume a half-round, horseshoe-shaped outline, the depression on the inner surface increasing until a well-marked ambulacral furrow is produced. The plates are likewise perforated a short distance in front of the same. The plates are united in two ways, by articulation (Pl. II, Fig. 1*e*) and by sizygial suture (Pl. II, Fig. 1*d*), the former producing a movable joint, the latter uniting adjacent plates immovably. Rows of pinnules are developed on the inner surface of the arms alternately from opposite sides, each row branching from the epizygale, where the sizygial suture is observed (Pl. II, Fig. 1*c*).

The arms attain very great length. Grinnell mentions a specimen examined by him where the arms measured 8 inches, and one examined by the writer was very nearly as long. Grinnell thinks the arms may reach 2 feet in length.

Related forms.—The present species is closely allied to *Uintacrinus westfalicus*, described by Schlüter[1] in 1878 from the Upper Cretaceous (Senonian) of Recklinghausen, in Westphalia. It is the only other species of this genus thus far described, so that a statement of the affinities of the two forms is important. In the composition of the basis the two species are very nearly identical. The radials and distichals show very slight differences, but the brachials in *U. socialis* are decidedly broader than in *U. westfalicus*. In the number and arrangement of the interradials the most marked difference is manifested. In *U. socialis* seven interradial plates encircle the eighth, or eighth and ninth, as the case may be, while in *U. westfalicus* the interradials are five in number, all of which come in contact with plates of other areas. Several minor differences appear in the rows of small plates that branch from the distichals. Otherwise, however, there is a marked similarity in the arrangement and form of the several plates. In general outline the two species are very similar.

Locality and geological horizon.—The first specimen was found on the slopes of the Uinta Mountains, in Utah, by Prof. Marsh, associated with *Ostrea congesta* Con., a typical Cretaceous form. Later, others were found in Kansas, associated with Odontornithes, Pterodactyls, and mosasauroid reptiles, likewise characteristic of the Cretaceous. Meek assigns the species to the Niobrara Group, a horizon of the upper Cretaceous.

Collections.—Peabody Museum, New Haven; U. S. National Museum.

APIOCRINIDÆ.

Calyx regular, composed of thick, articulated plates; basals five; radials 5 × 1–3. Exceptions frequent. Arms strong, numerously divided. Column long.

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[1] Zeitschr. der Deutsch. geol. Gesells., XXX, 1877, pp. 55–63, Pl. IV.

BOURGUETICRINUS D'Orbigny.

BOURGUETICRINUS ALABAMENSIS de Loriol.

Plate III, Figs. 1*a–c*.

Bourgueticrinus alabamensis de Loriol, 1882. Cincinnati Soc. Nat. Hist. Jour., vol. V, p. 118, Pl. V, Fig. 1, 1*a*, 1*b*.

As it has been impossible for the writer to obtain possession of the type of this species the description of de Loriol, as translated by Prof. S. A. Miller, is given verbatim: "This species is as yet known only by the basal cone which supports the calyx, and which is composed of several enlarging segments of the column surmounted by the basal plates. The height of the inverted cone is 5^{mm}; the diameter of the basal plate is 3½^{mm}, and that of the inferior segment of the column is 3^{mm} in its major axis. Its form is faintly swollen in the middle; the surface is smooth. The sutures are very indistinct, and it is a difficult matter to determine what was the height of the basal plate. The superior face of the cone carries five slender and comparatively elevated radiating ridges, which bound five deep depressions in which the basal pieces of the calyx were lodged; in the center an enlargement of the central canal constitutes the bottom of the calyx cavity. The articular face of the lower joint of the column forming the inferior end of the cone is elliptical, but the length of its major axis does not, however, much exceed that of its minor axis. It is slightly concave and encircled by a feeble rim along the circumference line; the transverse articular ridge process is reduced to two elongated tubercles which proceed from the marginal rim. Central canal comparatively large."

Related forms.—"Although this species is still very imperfectly known one can affirm that it is certainly distinct from *Bourgueticrinus ellipticus* Miller, by the much less swollen form of the basal cone, which is but slightly convex in outline, and by the facts that the lower segment of the cone is already elliptical and already possesses the rudiments of a transverse articular ridge. Furthermore, the radiating carinæ are very much more salient, and consequently the depressions which they separate very much deeper. Finally, by its central canal being relatively much larger."

Locality and geological horizon.—"Livingstone, Alabama, Ripley Group of the Cretaceous, or at the top of the Rotten limestone."

Collection.—Cincinnati Society of Natural History.

PENTACRINIDÆ.

Calyx small, "composed of five basals and five radials, with underbasals in one genus. The rays divide from one to eight times. The stems bear verticils of cirri at intervals. Two joints are united by syzygy at each node, to the upper one of which the cirri are articulated.

The internodes are traversed by five ligamentous bundles, which are interradially disposed, and give rise to a more or less petaloid figure on the joint-faces. No root nor radicular cirri." (P. H. Carpenter.)

PENTACRINUS Miller.

PENTACRINUS ASTERISCUS Meek and Hayden.

Plate III, Figs. 2 *a–d*.

Pentacrinus asteriscus Meek and Hayden, 1858. Philadelphia Acad. Nat. Sci. Proc., vol. 10, p. 49.

Pentacrinus asteriscus Meek and Hayden, 1860. Philadelphia Acad. Nat. Sci. Proc., vol. 12, p. 419.

Pentacrinus asteriscus Meek, 1864. Smith. Misc. Coll. (177), p. 27.

Pentacrinites asteriscus Meek and Hayden, 1865. Pal. Upper Missouri, Smith. Contr. Knowledge (172), p. 67, Pl. III, Fig. 2.

? *Pentacrinites asteriscus* Whitfield, 1880. Geol. Black Hills of Dakota, p. 345, Pl. III, Figs. 1, 2.

Determinative characters.—Calyx branching. Stem or column composed of small, pentagonal joints, rather thick, that bear at intervals small rounded processes or cirri. The column joints are connected by crenated ridges arranged in pentapetalous form. The stem is perforated by a central canal.

Dimensions.—Column: breadth of joint, $\frac{1}{20}$ to $\frac{1}{7}$ inch; length of joint, $\frac{1}{30}$ inch.

Description.—This species was first described by Meek and Hayden in 1858, in the Proceedings of the Academy of Natural Sciences of Philadelphia, from several fragments of the column. The calyx or arms are not known, and, as in the succeeding species, the distinguishing characteristics are confined entirely to the column joints. On the large slab figured by Meek and Hayden in the Paleontology of the Upper Missouri are several detached portions of the column 1 to 2 inches in length. The sutures are clearly marked and the nodal can be readily separated from the internodal joints. Of the latter, ten are plainly seen between two nodes on one fragment (Pl. III, Fig. 2 *a*), while in other instances the number seems to be slightly greater. All the joints are rather thick (Pl. III, Fig. 2 *c*). Five cirrus scars are found on each node in the reentering angles. Each node is joined to the underlying internode by syzygial suture, while the overlying plate is connected by crenulated ridges, as are also the internodal plates themselves. The arrangement of these ridges is distinctly petaloid (Pl. III, Fig. 2 *b*). The reentering angles of the outer surface of the stem are not deep, so that the points of each star-shaped prolongation are short and broad.

The cirri are composed of small round joints that are longer than broad. They are joined, as far as could be discerned, by simple sutures (Pl. III, Fig. 2*d*).

There is some doubt whether the form referred by Whitfield to *P. asteriscus* in the Geology of the Black Hills, and so figured and described, should be considered such. The reentering angles are much too deep. Unfortunately there is no side-view of the plates.

Related forms.—This species is wholly unlike the other American forms. In the first place, it is much smaller than *P. Whitei*, and *P. Bryani* and has a distinctly different form from *P. Whitei* with which it has been hitherto confounded. In *P. Whitei* the reentering angle is made deeper and of different shape. Likewise the crenulations of the petaloid area of the joints are differently arranged. The joints themselves are also relatively much thicker.

Locality and geological horizon.—Reported by Meek and Hayden[1] "associated with other Jurassic fossils from the southwest base of Black Hills, and opposite Red Buttes, North Platte river," the former in Dakota, the latter in Nebraska. In the Check List of Invertebrate Fossils from the Jurassic, Meek also mentions Idaho and Colorado. Peale mentions the occurrence of specimens in Idaho.

Collection.—U. S. National Museum.

PENTACRINUS WHITEI Clark.

Plate III, Figs. 4*a*–*c*.

Pentacrinites asteriscus White, 1875. U. S. Geog. Survs. west of 100th Meridian, vol. 4, 1875, p. 162, Pl. XIII, Figs. 6*a*-*b*.

?*Pentacrinites asteriscus* (?) Hall and Whitfield, 1877. U. S. Geol. Expl. 40th Parallel, vol. 4, pp. 280, 281, Pl. VI, Fig. 16.

?*Pentacrinites asteriscus* Whitfield, 1880. Geology of Black Hills of Dakota, p. 345, Pl. III, Figs. 1, 2.

Determinative characters.—Calyx wanting. Column composed of large, thin, pentagonal joints that possess deep reentering angles. The crenulated ridges of the suture have a petaloid arrangement. Column perforated by central canal.

Dimensions.—Column: breadth of joint, $\frac{1}{4}$ to $\frac{1}{3}$ inch; length of joint, $\frac{1}{30}$ inch.

Description.—In the volume upon paleontology of the quarto publications of the U. S. Geological Surveys West of the One-Hundredth Meridian, Dr. White figures and refers a form to *Pentacrinites asteriscus* Meek and Hayden, that belongs evidently to another species. A comparison by the writer of the specimens figured by Meek and Hayden and by White shows that the differences are too great to permit their reference to the same species. The name *P. Whitei* is therefore suggested for the new form in honor of the distinguished scientist who has done so much to advance our knowledge of American Mesozoic geology and paleontology. As with *P. asteriscus* only portions of the column of *P. Whitei* have been discovered. The outer side of the column is furrowed by deep reentering angles producing five prominent ridges at the salient angles. The joints are relatively thin, with rounded edges, so that the column does not appear compactly formed from outward aspect (Pl. III, Fig. 4*c*). A distinctly petaloid arrangement of the crenulated ridges is exhibited (Pl. III, Figs. 4*a*, 4*b*).

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[1] Paleontology Upper Missouri, p. 67.

Hall and Whitfield refer to *Pentacrinites asteriscus* Meek and Hayden certain specimens collected by Hague in Nevada from "limestone of supposed Triassic age." There is some doubt as to the identity of this form, though the description and figures render it probable that it should be referred to *P. Whitei.*

The form figured and described by Whitfield from the Black Hills under the name *P. asteriscus* is, on account of the deep reentering angles, to be probably associated with *P. Whitei.* No side view of the joints is given by which comparison may be made.

Related forms.—Separated from *P. asteriscus*, with which it has been hitherto confounded, by its larger size, deeper reentering angles, and relatively much thinner plates.

Locality and geological horizon.—The type specimens of this form are from the Jurassic of Salt creek and Diamond valley, Utah.

Collection.—U. S. National Museum.

PENTACRINUS BRYANI Gabb.

Plate III, Figs. 3*a–b*.

Pentacrinus Bryani Gabb, 1876. Philadelphia Acad. Nat. Sci. Proc., vol. 28, p. 178, Pl. 5, Figs. 1, 1*a*, 1*b*.

Determinative characters.—Calyx wanting. Column composed of moderately large, rather thick, pentagonal joints, with sharp reentering angles. The crenulated ridges are broadly petaloid and each area is rounded at its outer extremity. Column perforated by canal.

Dimensions.—Column: breadth of joint, $\frac{1}{20}$ inch; length of joint, $\frac{1}{4}$ inch.

Description.—Two small fragments of the stem of this form are described by Gabb in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1876. As the only representative of this family reported from the American Cretaceous it possesses considerable interest. The column is composed of moderately large, thick joints, that in breadth reach quite one-quarter of an inch in diameter and about one-fifth of that in thickness. The broad rounded ridges at the salient angles of the pentagonal outline form a nearly unbroken line, while the furrow at the reentering angles is alternately depressed and elevated in successive joints. The edge of each joint is slightly rounded. The crenulated surfaces form five broad petaloid areas distinctly rounded at the outer extremities (Pl. III, Fig. 3*a*) and unite near the inner edge of the reentering angles to form a double flat-topped ridge that reaches to the central canal, around which there is likewise a slight elevation. The crenulations are visible on the outer surface of the column. The column is perforated by a central canal.

Related forms.—As the only representative of this family in the

Cretaceous, there is little among the American forms with which it may be compared, especially as the two Jurassic types previously described show marked differences in every particular.

Locality and geological horizon.—The specimens described by Gabb and examined by the writer are from the yellow limestone of Vincentown, New Jersey. The yellow limestone belongs to the middle marl bed and is upper Cretaceous.

Collections. Philadelphia Academy of Natural Sciences; Johns Hopkins University.

ASTEROIDEA.

OPHIURIDÆ.

Body star-shaped, with central disk and elongated arms, which are distinctly separated from the disk. The ambulacral grooves are generally covered with plates.

OPHIOGLYPHA Lyman.

OPHIOGLYPHA BRIDGERENSIS (Meek).

Plate IV, Figs. 2*a*–*b*.

Ophioderma ? bridgerensis Meek, 1873. U. S. Geol. Surv. Territories for 1872, p. 475.

Ophioderma ? bridgerensis White, 1883. U. S. Geol. and Geog. Surv. of the Territories for 1878, pp. 8, 9, Pl. 12, Fig. 12*a*.

Determinative characters.—Disk composed of numerous small imbricating plates. Upper arm plates wider than long, the outer angles sharp and extending between the side arm plates, which are slightly smaller. Under arm plates long and nearly rectangular in shape.

Dimensions.—Diameter of disk, $\frac{1}{4}$ inch. Length of arm, $\frac{3}{4}$ inch. Width of arm near disk, $\frac{1}{20}$ inch.

Description.—The single specimen of this species thus far found is described in a foot-note to a list of specimens appended to the paleontological report of F. B. Meek in the Annual Report of the U. S. Geological Survey of the Territories for 1872, and redescribed and figured by Dr. C. A. White in the Annual Report for 1878 of the same organization. This specimen, which has been carefully examined by the writer, presents the upper surface of the disk and fragments of the five arms. Upon all but one fragment the upper and side arm plates are shown, while upon that a minute portion of the under surface of a single arm with the under arm plates and ambulacral openings is preserved.

The disk is described by Meek as "depressed, nearly circular, showing on the dorsal side ten ovate-subtrigonal radial plates, that are joined together over the inner ends of the arms, so as to form five pairs." A close examination of the specimen shows that the disk is made up of numerous small imbricating plates, and that the supposed division into ten, as mentioned by Meek, may be explained by the fractured condition of the poorly-preserved specimen.

The arms are small, and are, as stated by Meek, perhaps ¾ inch in length, although none of them are preserved entire. The upper arm plates are wider than long, and hexagonal in form (Pl. IV, Fig. 2*b*). The outer angles are sharp, and are embraced between the upper portions of the side plates. The latter are slightly swollen, but are not shown in their entire length. The lower arm plates are poorly preserved, but so far as exhibited are long and narrow, nearly rectangular in shape and slightly swollen in their central portions.

Related forms.—There is some doubt as to the generic position of this species. So many of the distinctive characters are wanting that a definite determination in that particular is quite impossible, but from the apparent structure of the disk, formed of numerous imbricating plates, its reference to *Ophioglypha* seems probable. The only other form, *O. texana*, has a somewhat smaller and differently constructed disk so far as can be discerned, and both the upper and under arm plates are of different shape.

Locality and geological horizon.—This form is reported by Meek, from the "last foot of Bridger Peak, 4 miles north of Fort Ellis, Montana," associated with undeterminable species of the genera *Gryphæa*, *Avicula*, *Inoceramus*, *Crassatella*, *Pholadomya*, *Turritella* and *Gyrodes*, that denote the Cretaceous age of the strata.

Collection.—U. S. National Museum.

OPHIOGLYPHA TEXANA Clark.

Plate IV, Figs. 1*a*–*c*.

Determinative characters.—Disk round; composition indistinct. Arms long, with wedge-shaped under arm plates about as wide as long; upper arm plates about twice as wide as long.

Dimensions.—Diameter of disk, ⅕ inch; length of arm, 2 inches; width of arm at disk, 1/12 inch.

Description.—The determination of this species is dependent upon three fairly well preserved forms that are grouped upon a single slab of limestone, all with the lower side exposed. The surface upon which they rest is considerably weathered, so that many of the details of structure have consequently suffered. The general form of the disk is preserved, though its composition can not be made out. In many instances the arm plates have disappeared, leaving only the skeletal pieces. Where preserved, the under arm plates are wedge-shaped and about as wide as long (Pl. IV, Fig. 1*c*). The upper arm plates, which are shown only as impressions upon the limestone, are nearly twice as wide as long, and have their lateral edges rounded (Pl. IV, Fig. 1*b*).

Related forms.—Although this form can not with certainty be referred to *Ophioglypha*, it possesses, however, many points of similarity to the previous species, from which, on the other hand, it is separated by the different shape of the disk and of the under and upper arm plates.

Locality and geological horizon.—The slab containing the specimens described is from the Denison beds of the Washita division of the Comanche series (Lower Cretaceous), 6 miles north of Fort Worth, on the banks of Fossil creek. It is found associated with *Ostrea quadriplicata* Shumard, *Stearnsia Robbinsi* White, and *Leiocidaris hemigranosus* (Shumard).

Collection.—U. S. National Museum.

STELLERIDÆ.

Body star-shaped or pentagonal, composed of a central disk and five prolongations of the same, called arms, that are portions of the body proper. Integument strengthened by calcareous plates irregularly arranged. Ambulacral furrow uncovered.

ASTERIAS Linnæus.

ASTERIAS? DUBIUM Whitfield.

Plate V, Fig. 2.

Asterias? dubium Whitfield, 1877. Prelim. Rept. Pal. Black Hills, p. 15.
Asterias? dubium Whitfield, 1880. Geol. Black Hills of Dakota, pp. 344, 345, Pl. 3, Fig. 3.

Determinative characters.—Imperfectly preserved forms of small size, with slender flexuous arms, apparently covered superiorly with longitudinal rows of plates.

Dimensions.—Length of arms, ¾ inch to 1¼ inches.

Description.—This interesting but doubtful form is thus characterized by Whitfield: "The specimens are not in condition to afford a full description of their specific characters. They are of small size, the rays being from three-fourths of an inch to one and one-fourth inches long, measuring from the center of the body. The rays are slender and flexuous, most of them being more or less curved in their direction and elevated along the middle, as shown on a gutta-percha cast taken in a natural mold of a group of three individuals. The upper surface is subangular, and in structure they are apparently composed of small uniform plates, placed in longitudinal rows. The center of the body or disk is marked by an obscurely pentangular depression on the upper surface. None of the specimens show the under side of the body or rays, so that the characters of these parts are entirely unknown.

"The species appears to have been somewhat abundant, judging from the condition in which they are grouped on the sandstone, and, although the specimens are obscure and too imperfect for positive determination and description, it has been thought best to designate them by names, as they will undoubtedly prove a characteristic form over a certain region and of a limited horizon. The sandstone is marked by the layers in which they are found by ripple or wave marks, having a width of about 3 inches, and indicates a near proximity to a shore line over the area where they were obtained, and that the individuals are probably stranded specimens. A single very imperfect impression of a lamellibranchiate shell is present on the same fragments of rock, but too imperfect for determination."

Related forms.—This very doubtful species scarcely admits of comparison with other forms. There is nothing hitherto reported from American strata that can be closely associated with it.

Locality and geological horizon.—This form is reported by Whitfield as occurring "in red sandstones of Jurassic age, 70 feet above the red beds, on the east side of Spearfish creek, near its junction with the Redwater, Black Hills, Dakota."

Collection.—U. S. National Museum.

GONIASTER Agassiz.

GONIASTER MAMMILLATA Gabb.

Plate v, Figs. 1*a*–*h*.

Goniaster mammillata Gabb, 1876. Philadelphia Acad. Nat. Sci. Proc., vol. 28, pp. 178, 179, Figs. 2, 2*a*, 2*b*.

Determinative characters.—Body pentagonal, provided with a dorsal and a ventral row of marginal plates that are narrower than high, and distinctly tumid on their outer surfaces. Only detached marginal plates preserved.

Description.—Gabb mentions the discovery of about thirty detached marginal plates of this species. They differ widely in shape by reason of their position upon the margin, but among those examined the majority are higher than wide, and swollen on the outer surfaces. Certain of the plates show marked protuberances upon the general level of the plate (Pl. v, Figs. 1*a*, 1*b*). The surface of the plates is punctate, the small depressions being arranged in rows that cross one another at right angles (Pl. v, Fig. 1*h*).

Related forms.—There are no American forms similar to this species with which it may be confounded, while the absence of all knowledge of the characters outside of a few marginal plates renders wide comparisons impossible.

Locality and geological horizon.—Yellow limestone of the middle marl bed of the Cretaceous from Vincentown, New Jersey.

Collections.—Philadelphia Academy of Natural Sciences; Johns Hopkins University.

ECHINOIDEA.

EUECHINOIDEA.

REGULARES.

CIDARIDÆ.

Test spheroidal. Ambulacral areas narrow, more or less flexuous, and covered only with very small tubercles. Interambulacral areas very wide, with two rows of large tubercles that bear the primary spines. The apical disk is composed of five genital and five ocular plates.

CIDARIS Klein emend. Lamarck.

CIDARIS SPLENDENS Morton.

Plate VI, Figs. 3*a–g*.

Cidaris (?) *sp.* Morton, 1829. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 123.

Echinus sp. Morton, 1830. Amer. Jour. Sci., 1st ser., vol. 17, p. 287; vol. 18, Pl. III, Figs. 12, 13.

Cidarites splendens[1] Morton, 1841. Philadelphia Acad. Nat. Sci. Proc., vol. 1, p. 132.

Cidarites armiger Morton, 1842. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 8, p. 215, Pl. II, Fig. 1.

Cidaris armiger Gabb, 1859. Cat. Invert. Fossils, Cretaceous Formation, p. 18.

Cidaris splendens Gabb, 1859. Cat. Invert. Fossils, Cretaceous Formation, p. 18.

Cidaris armiger Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test of moderate size, spheroidal. Ambulacral areas narrow, flexuous, with four rows of granules between the pore pairs, the outer rows larger than the inner; imperfectly defined granules also appear between the pores of each pair. Interambulacral areas very wide, with seven or eight plates in each column, each plate bearing a tubercle of large size, that is characterized by a wide circular areola, smooth boss, and small perforated mamelon. Miliary area small and covered with numerous thickly-set granules of small size. Sutures sharply defined, depressed. Spines elongated, cylindrical, with longitudinal rows of sharp denticulated processes.

Dimensions.—Height, 7/8 inch; width, 1 3/8 inches.

Description.—The first mention of this form is made by Morton in 1829, when he doubtfully referred a few fragments to *Cidaris* without an attempt at specific determination. Several of the more important characters were then given, but as the material examined included only detached plates and a few spines the description necessarily lacked much of completeness. In 1841 Morton proposed the name *Cidarites splendens* and then more accurately defined the species. In 1842 he redescribed and now for the first time figured the same form as *Cidar-*

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[1] Morton doubtless intended to use the term *splendens* instead of *splendeus*, which is probably a typographical error. In the publication of 1842, where *armiger* is substituted, the form *splendens* is used.

ites armiger, a name which he stated he desired substituted for *C. splendens*. Gabb, in his Catalogue of the Invertebrate Fossils of the Cretaceous Formation of the United States, employs both names, mistaking them for independent species, although *C. splendens* is referred to as *C. splendeus*. The specimens examined by the writer are chiefly detached plates, and in no instance is the entire test preserved, as in the figure given by Morton. Two entire, or nearly entire, interambulacral areas, with part or all of the adjoining ambulacra, are among this material (Pl. VI, Fig. 3*a*). In these specimens the oral side is slightly more depressed than the aboral, although not to the extent exhibited in Morton's figure. The ambulacral areas, which are narrow and flexuous, have, between the poriferous avenues, four granules. In the center of each column of plates these granules are approximately of equal size, the outer rows slightly larger, but toward the disk or toward the mouth opening the inner rows rapidly diminish in size and finally disappear. The pores are oval in shape, with funnel-like openings exteriorly. Each row of pores is separated from that which accompanies it in the same avenue by a row of imperfectly defined granules that form an undulating ridge (Pl. VI, Fig. 3*c*).

The interambulacral areas are very wide and bear large tubercles, each of which covers the greater portion of its respective plate (Pl. VI, Fig. 3*b*). Upon the larger plates, in the center of each column, the areolas are circular, but become somewhat oval toward both disk and mouth opening. The outer edge of each areola is surrounded by a circle of large granules that give it a crenulated appearance. The areola rises from its depressed margin, gradually at first, then rapidly, to the boss, which reaches a marked elevation above the general level of the plate. The boss is of moderate width and smooth. From its center rises the mamelon, which is small, perforated, and slightly flattened upon the upper surface (Pl. VI, Fig. 3*d*). The miliary space is covered by small granules, that are most numerously developed along the median line of the interambulacra.

None of the specimens afford the apical disk. Strong auriculæ show the presence of powerful jaws.

The spines are slender, elongated, cylindrical, with longitudinal, serrated ribs that gradually become obsolete toward the base (Pl. VI, Fig. 3*e*). The collar is short and finely striated longitudinally (Pl. VI, Fig. 3*f*). The acetabulum is bordered by a smooth margin and is perforated in the center (Pl. VI, Fig. 3*g*).

Related forms.—In many particulars *Cidaris splendens* (Morton) shows points of comparison with *C. serrata* Desor of the European Cretaceous, but the American species differs from it in its smaller miliary areas and higher areolas, and also in the presence of only four rows of granules between the poriferous avenues.

Locality and geological horizon.—This species is reported by Morton from Timber creek, New Jersey, which establishes the horizon as that of the yellow limestone of the middle marl bed (upper Cretaceous). It has also been found by the writer near Vincentown in the same formation.

Collections.—Philadelphia Academy of Natural Sciences; Johns Hopkins University.

CIDARIS TAYLORENSIS Clark.

Plate VI, Figs. 2*a*–*b*.

Determinative characters.—Test small. Interambulacral areas wide. Tubercles large, with circular areolas, much depressed marginally; boss crenulated; mamelon perforated. Miliary space narrow. Spines long, cylindrical, covered with small granules arranged in longitudinal rows.

Dimensions.—Test undetermined. Spines: length 1½ inches (?); width in broadest portion, $\frac{3}{16}$ inch.

Description.—The fragments of this form, although they admit of determination of but few of the important characters, warrant specific description from the fact that they are totally distinct from the only other representative of Cidaris from the Jurassic rocks of America. The small fragments of the interambulacral area and the spine occur together and doubtless formed part of the same individual. The interambulacral plates, of which only portions are preserved on the specimen figured, indicate a form of no great size (Pl. VI, Fig. 2*a*). The tubercles are large, with depressed areolas surrounded by a circle of large granules. The boss is crenulated and the mamelon perforated. The miliary space is apparently narrow, the tubercles of adjacent plates in the same column being nearly confluent.

The spine is long, gently tapering toward the base in the portion preserved, and covered with longitudinal rows of small granules (Pl. VI, Fig. 2*b*).

Related forms.—As the Jurassic strata of North America afford few fossil Echinodermata as compared with the Cretaceous, there are not many American types with which the present form may be compared. *Cidaris californicus*, the only other representative of this genus thus far reported, has no portion of the test preserved, so that the comparison is limited to the spines. In *C. taylorensis* the spines are long and cylindrical, while in *C. californicus* they are short and thick set, and there is a totally different surface decoration.

Locality and geological horizon.—This species is known only from the Jurassic strata of Taylorsville, California.

Collection.—U. S. National Museum.

CIDARIS CALIFORNICUS Clark.

Plate VI, Figs. 1*a*–*b*.

Determinative characters.—Test unknown. Spines large, club-shaped, with rows of large granules that coalesce to form longitudinal ridges which extend from neck to point of spine.

Dimensions.—Spine: length, $\frac{7}{8}$ inch; breadth in thickest part, $\frac{3}{16}$ inch.

Description.—This species is based upon detached spines, four or five specimens of which are afforded in material from Taylorsville, California. They are distinctive in every way, and can not be mistaken, even in fragments. The specimens examined occur as casts, but so well preserved that impressions in gutta-percha, from which the drawings were made, show the characters completely. Each spine has a short narrow neck, beyond which it rapidly increases in size so as to give a club-shaped outline to the middle and upper portions. Rows of longitudinal granules cover the surface from the neck to the point of the spine, presenting the appearance of long serrated ridges (Pl. VI, Figs. 1*a*–*b*).

Related forms.—Separated from *C. taylorensis* by its club-shaped form and surface characters.

Locality and geological horizon.—This species is found in Jurassic strata at Taylorsville, California.

Collection.—U. S. National Museum.

CIDARIS TEXANUS Clark.

Plate VII, Figs. 1*a*–*e*.

Cidaris texanus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test large, inflated. Ambulacral areas narrow, sinuous, with four rows of granules between the poriferous avenues, which at the ambitus are increased to six and toward the apical disk and mouth opening are reduced to two rows. Pores oval, separated by transverse elevations, which partially envelop the openings. Interambulacral areas wide, with large circular tubercles. Areola circular, depressed; boss smooth; mamelon small, perforated. Miliary space wide, covered with numerous small granules.

Dimensions.—Height, $1\frac{1}{4}$ inches; width, $2\frac{1}{4}$ inches.

Description.—A large portion of the test of this beautiful species is in an excellent state of preservation. All of the characteristic features, with the exception of those relating to the apical disk and mouth edges, are clearly shown. The test, however, is somewhat compressed, so that the original form can not be with certainty made out. The ambulacral areas are narrow and slightly flexuous. Between the poriferous avenues, which are narrow and depressed, are four rows of granules of nearly equal size which directly at the ambitus are increased to six, while toward both apical disk and mouth opening they are reduced to two. Irregularly scattered among the rows of granules are others smaller in size. The pores are oval and separated by transverse elevations that partially encircle the openings, leaving a depression between each pair (Pl. VII, Fig. 1*c*).

The interambulacral plates are wide and bear large circular tubercles (Pl. VII, Fig. 1*d*). The areola of each tubercle is radially ridged, deeply depressed, and surrounded by a row of mammilated granules. The boss is slightly elevated above the level of the plate, and presents a smooth and sharp ridge around the small perforated mamelon (Pl. VII, Fig. 1*e*). The miliary space is wide and thickly set with small elevated granules of equal size. The apical disk and mouth edges are lacking.

Related forms.—At first sight this species shows strong points of similarity with *C. sceptrifera* Mantell from the White Chalk of England, although the arrangement of granules in the ambulacral area is different. The areola of *C. sceptrifera* is described as smooth, while that of *C. texanus* is clearly ridged radially. The only related form reported from Texas is *Leiocidaris hemigranosus*, formerly referred to *Cidaris*, but which, as will be shown, does not belong to that genus. *Cidaris Branneri*, from Brazil, described by White, is allied to *C. texanus*, although presenting differences in the character of the areola and arrangement of granules in both the ambulacral and interambulacral areas.

Locality and geological horizon.—This form is found in the Washita formation of the Comanche series (lower Cretaceous) of Bexar county, Texas.

Collection.—U. S. National Museum.

CIDARIS WALCOTTI Clark.

Plate VI, Figs. 4*a–d*

Cidaris Walcotti Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test small, inflated. Ambulacral areas narrow, sinuous, with four rows of granules between the depressed poriferous avenues. Interambulacral areas broad; each tubercle with depressed circular areola, smooth boss and small imperforate mamelon. Miliary space wide, thickly covered with small granules.

Dimensions.—Height, 1 inch (?). Width, 1½ inches (?).

Description.—The fragments of this form examined are sufficiently distinctive to separate it from other species. A nearly complete interambulacral area, with the adjoining ambulacra, shows that the test of the species is small and in a marked degree inflated (Pl. VI, Fig. 4*a*).

The ambulacral areas are narrow, slightly sinuous, and provided with four nearly equal rows of granules between the poriferous avenues (Pl. VI, Fig. 4*c*). At times additional granules are irregularly interspersed. The poriferous avenues themselves are narrow, deeply depressed, and slightly sinuous. The pores are round, with funnel-shaped openings, produced by the intersecting ridges. These ridges, which separate the individual pores and the pore pairs, give a lattice-like appearance to the poriferous zones.

The interambulacral plates are moderately large. On account of the indistinctly marked sutures the small tubercles and numerous granules cause a very even surface over the entire interambulacral area (Pl. VI, Fig. 4*b*). The tubercles are circular and stand nearer the outer margin of the plates than the inner. The areolas are deeply depressed, the central portion but slightly exceeding the margin in height. The boss is smooth and stands but little above the level of the plate. The mamelon is imperforate (Pl. VI, Fig. 4*d*). The wide miliary space is covered with a large number of irregularly arranged granules of equal size. The broken specimens afford no information as to the character of the apical disk or mouth edges.

Related forms.—This species is very readily separated from *C. splendens*, the only other representative of this genus thus far reported from the Atlantic Coast Cretaceous, in possessing imperforate mamelons and wide miliary spaces, over which the granules are regularly scattered. The even surface of the test is likewise a distinguishing feature.

Locality and geological horizon.—The specimens of this form examined by the writer were found associated with *C. splendens* in the yellow limestone of the middle marl bed (upper Cretaceous), of Timber creek, New Jersey.

Collection.—Philadelphia Academy of Natural Sciences.

LEIOCIDARIS Desor.

LEIOCIDARIS HEMIGRANOSUS (Shumard).

Plate VII, Figs. 2*a–d*. Plate VIII, Figs. 1*a–b*. Plate IX, Fig. 1*a–c*.

Cidaris hemigranosus Shumard, 1860. St. Louis, Acad. Sci. Trans., vol. 1, p. 609.
Cidaris hemigranosus Meek, 1864. Smith. Misc. Coll. (vol. 7, 177), p. 2.
Cidaris hemigranosus White, 1883. U. S. Geol. and Geog. Surv. of the Territories, 12th Ann. Rept. for 1878, p. 38, Pl. 18, Figs. 2*a–b*.
Leiocidaris hemigranosus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test very large, subspherical. Ambulacral areas narrow, sinuous, with six rows of granules in the middle. Poriferous avenues wide, deeply depressed. Pores of each pair united by clearly defined furrow. Interambulacral areas broad. Tubercles very large; areola circular or slightly polygonal, depressed; boss smooth; mamelon large, perforated. Miliary space covered with large scattered oval granules. Sutures clearly marked, depressed.

Dimensions.—Height, 2½ inches; width, 3¾ inches.

Description.—This form, which was quite fully described by Shumard in 1860, but not figured, was incorrectly referred to the genus *Cidaris*, from which it is separated by the presence of furrows uniting the pores of each pair. In this respect it is a typical representative of the genus *Leiocidaris* of Desor. A very good illustration is given by Dr. White in the Twelfth Annual Report for 1878 of the U. S. Geological and Geographical Survey of the Territories, although necessarily, from the size of the figure, the furrows connecting the pores are not very distinctly shown. This species is the largest echinoid known from the Texas Cretaceous, and, with possibly a single exception, the largest from the American Mesozoic. In one unusually fine specimen obtained from Prof. R. T. Hill the test is subspherical, although considerably broader and more flattened on the oral than aboral side.[1]

The ambulacral areas are narrow and sinuous, with six rows of granules between the poriferous avenues (Pl. VII, Fig. 2*b*). The regular arrangement of the granules is not persistent, the number being increased irregularly near the middle of the column and somewhat reduced toward the apical disk and the mouth opening. The poriferous avenues are wide and deeply depressed, the pores of each pair being united by a shallow furrow.

The interambulacral areas are wide and the plates of massive size (Pl. VII, Fig. 2*a*). The tubercles occupy the center of the plates and are large and prominent. The areolas are deeply depressed, subcircular or slightly polygonal, and occupy more than half of the greatest diameter of the plates. On all the specimens examined the areolas show perfectly smooth surfaces, although Shumard mentions the occurrence of radiating ridges. Toward the center each areola rises to form the boss, which is provided marginally with a sharp smooth ridge. The mamelon is large, subspherical, with a deep perforation upon its summit (Pl. VII, Fig. 2*c*). The miliary space is wide and covered with large, irregularly-shaped and flattened granules, some round and some oval in form. Interspersed among these are much smaller granules, which increase in number along the margin of the plates. The apical disk and mouth edges are wanting.

Related forms.—This species is readily separated from any hitherto described from American or European strata. Its characters are well defined and distinctive.

Locality and geological horizon.—Shumard says that it is found "in the Washita limestone [Comanche series (lower Cretaceous)], forming the upper part of the Bluff of Red river, Lamar county, and 10 miles above the mouth of Kiamesha creek, at both localities associated with *Ostrea quadriplicata*." This places it in the Denison beds. It has only been reported from Texas.

Collections.—U. S. National Museum; Prof. R. T. Hill.

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[1] A much more perfect specimen (Pl. IX, Figs. 1*a*–*c*) has been examined by the writer since the above description was prepared.

SALENIDÆ.

Test spheroidal or depressed. Ambulacral areas narrow, straight or flexuous; poriferous zones narrow; pores round, unigeminal, often increased in number toward the mouth opening. Interambulacral areas broad, with two rows of primary tubercles. Apical disk large and prominent. Mouth opening large, with incisions at regular intervals. Anal opening eccentric.

SALENIA Gray.

SALENIA TEXANA Credner.

Plate x, Figs. 1*a–h*.

Cidaris diatretum Giebel, 1853. Jahresber. d. Naturw. Vereins in Halle, 1852, p. 374, Pl. 7, Fig. 2.

Salenia texana Credner, 1875. Zeitschr. f. d. Ges. Naturw., XLVI, pp. 105–116, Pl. V, Figs. 1–6.

Salenia texana Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test subglobose; upper surface convex; sides inflated; under surface flat. Ambulacra narrow, flexuous, with two rows of mammillated granules in each area; poriferous zones flexed; pores unigeminal. Interambulacral areas wide, with two rows of alternating plates, six in each row. Apical disk large, convex, subcircular; anal opening prominent. Mouth opening moderately large.

Dimensions.—Height, ¾ inch; transverse diameter, 1 inch.

Description.—Credner in the Zeitschrift für die gesammten Naturwissenschaften zu Berlin for 1876 presents the first complete diagnosis of a North American Mesozoic echinoid, in the detailed descriptions accorded the present species. Its reference by Professor Giebel in 1852 to *Cidaris diatretum* (=*Pseudodiadema diatretum*) is shown from the carefully prepared specimens to have been erroneous.

The test is subspherical when complete, but in the specimens examined is generally somewhat flattened, both actinally and abactinally. The lower surface is slightly concave in the vicinity of the mouth opening. The sides are inflated, presenting a rounded surface which is fuller above than below (Pl. x, Fig. 1*c*).

The ambulacral areas are narrow, increasing gradually in width from the apical disk to the mouth opening. Two rows of mammillated granules, twenty-four to twenty-six in each, occupy the middle of each area. Very minute granules extend in a line between the rows and in the vicinity of the mouth opening surround the larger granules themselves. The poriferous zones are narrow and flexuous and the pores are regularly arranged in a unigeminal series; near the mouth opening they are slightly more crowded. The most pronounced flexure is opposite the second interambulacral plate from the apical disk. Toward the mouth opening the zones become nearly straight (Pl. x, Figs. 1*e*, 1*f*).

The interambulacral areas are broad, and formed of two alternating rows of broad plates, six in each row (Pl. x, Fig. 1*d*). The tubercles increase rapidly in size from the mouth edges, where they are scarcely larger than the mamillated granules of the ambulacral areas. The areolas are large, and surrounded by mamillated granules of various sizes, that are crowded together along the inner edge of the plates. Between the larger granules are numerous minute granules. The areola rises to a prominent boss, that is deeply crenulated, and bears an imperforate mamelon (Pl. x, Fig. 1*h*).

The apical disk is very large, convex, subcircular, with radiating ridges that extend from the ovarial openings of each plate and unite with similar ridges of adjacent plates. Small punctures are found at the angles of the plates and intermediate between them (Pl. x, Fig. 1*g*). The subanal plate is situated before the anal opening, and occupies the center of the disk. The anal opening is subelliptical, rounded anteriorly, angular posteriorly, and slightly elevated at the border.

The under surface is flat and the mouth opening large, covering nearly one-half the diameter of the test. The mouth opening is circular, with ten incisions upon the edge that divide it into nearly equal-sized lobes (Pl. x, Fig. 1*b*).

Related forms.—Credner, in discussing the affinities of this form, considers it to be closely related to *Salenia petalifera* Defr., and *S. Desori* Wright. It is somewhat more elevated than *S. petalifera*, and the radial ridges on the apical disk are less pronounced on the latter than on the former. The ocular plates also enter less compactly into the composition of the disk in the latter species. In *S. Desori*, on the other hand, there is a wider difference, both in the character of the test plates and the decorations of the apical disk. With *S. scutigera* Gray it also shows some points in common.

Locality and geological horizon.—This form is from Cileola, Comanche spring, Texas, in the Washita formation of the Comanche series (lower Cretaceous).

Collections.—U. S. National Museum; Boston Society of Natural History.

SALENIA TUMIDULA Clark.

Plate XI, Figs. 1*a*–*j*.

Salenia tumidula Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test small, subglobose; outline of upper surface regularly convex. Ambulacral areas narrow, nearly straight, with two rows of mammillated granules between the pore pairs; poriferous zones slightly flexed; pores unigeminal. Interambulacral areas wide, composed of two alternating rows of five or six plates. Apical disk large, regularly convex, subcircular; anal opening slightly elevated. Mouth opening small.

Dimensions.—Height, ⅜ inch; transverse diameter, ½ inch.

Description.—The perfectly preserved specimens of this beautiful species admit of a determination of all the details of structure.

The general form of the test is subglobose. The sides are inflated and regularly curved, rising into a convex upper surface, from which the anal opening projects but slightly (Pl. XI, Fig. 1*c*). The lower surface is quite flat, and toward the mouth opening slightly depressed.

The ambulacral areas are rather broad, increasing in width from the apical disk to the mouth-edges (Pl. XI, Fig. 1*f*). Extending along the center of each area are two rows of mammillated granules, fifteen or sixteen in each row, between which are other minute granules. The poriferous zones are narrow and nearly straight; the pores round, regularly arranged in a unigeminal series, and largest in the middle of the column.

The interambulacral areas consist of two rows of alternating plates, five or six in each row (Pl. XI, Fig. 1*d*). The larger tubercles diminish rapidly in size toward the mouth edges, and are very indistinct on the plates bordering the same. Each areola is large and circular, the boss crenulated, and the mamelon flattened and imperforate (Pl. XI, Fig. 1*j*). The miliary space is bordered with oval granules of irregular size and arrangement, although most numerous between the rows of tubercles. The sutures of the plates are very indistinctly marked.

The apical disk is prominent, subcircular, with a regularly curved convex surface, from which the anal aperture projects but slightly. The granular decorations of the surface often coalesce and appear as broken ridges extending radially from the five openings in the genital plates (Pl. XI, Fig. 1*g*). The anal opening is oval, slightly pointed below, and projects but slightly above the level of the apical disk. It is bordered by a flange-like edge that is formed of the anal and two genital plates.

The mouth opening is small, occupying scarcely two-fifths of the diameter of the test. Ten incisions divide the edge into lobes, the ambulacral lobes projecting the farther (Pl. XI, Fig. 1*i*).

Related forms.—The identity of this species is readily established by the straight poriferous zones and peculiar decorations of the apical disk. The number of mammillated granules in the ambulacral areas is less than in *S. texana*, while the oval granules of the interambulacral areas are readily distinguishable from the round forms of *S. bellula*.

The anal aperture also projects far less than in *S. texana*, although in this respect it is not unlike *S. bellula*.

Locality and geological horizon.—This species is from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collection.—Philadelphia Academy of Natural Sciences; Johns Hopkins University.

SALENIA BELLULA Clark.

Plate XI, Figs. 2*a*–*g*.

Salenia bellula Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test small, compressed, circular; upper surface convex; sides inflated; under surface flat. Ambulacral areas rather broad, nearly straight, with two rows of granules in each row; poriferous zones broad, very slightly flexed; pores round, unigeminal. Interambulacral areas wide. Apical disk convex and nearly circular. Mouth opening small.

Dimensions.—Height, $\frac{1}{2}$ inch; transverse diameter, $\frac{5}{16}$ inch.

Description.—This *Salenia* is a very rare form, only a few specimens having come under the notice of the writer, yet from certain peculiarities of outline and structure it is not to be confounded with other species heretofore described.

In general outline the test is somewhat flattened; the upper surface is regularly convex, the sides are inflated, the lower surface is flat or slightly concave at the mouth opening.

The ambulacral areas are prominent and change but slightly in width from the apical disk to the mouth edges. Two rows of mammillated granules, fifteen in each, occupy the center of each area.

The interambulacral areas are wide and consist of two rows of alternating plates, five or six in each. The tubercles are prominent, but decrease rapidly in size toward the mouth edges. The areola is of moderate size, the boss narrow and indistinctly crenulated, and the mamelon small, flattened, and imperforate (Pl. XI, Fig. 2*g*). An indistinct circle of mammillated granules surrounds each tubercle. They unite to form a sinuous double series between the rows of tubercles. Between the larger granules are scattered irregularly numerous small granules that are crowded together along the central line of the interambulacral area (Pl. XI, Fig. 2*d*).

The apical disk is slightly convex, the anal opening interfering but little with the regularity of the curved surface. The anal opening is subcircular, with a flange-like rim. The plates are decorated with oval granules that are arranged in radial rows extending from the opening of each genital plate and unite with corresponding rows of adjacent plates at the suture (Pl. XI, Fig. 2*f*).

The mouth opening is small, being but one-third of the transverse diameter of the test. Ten weak incisions divide the edges into lobes that are nearly of equal size (Pl. XI, Fig. 2*b*).

Related forms.—This species is quite distinct from *Salenia texana* or *S. tumidula*, and at the same time does not admit of reference to any of the European species. It is most closely related to *S. tumidula*, but is more compressed, has a differently shaped and decorated apical disk, and has round and mammillated granules in the miliary space, while those of *S. tumidula* are characteristically oval.

Locality and geological horizon.—This species, like *S. tumidula*, is only found in the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collections.—Philadelphia Academy of Natural Sciences; American Museum of Natural History, New York.

DIADEMATIDÆ.

Test more or less spheroidal. Ambulacral areas broad, at times approaching the interambulacral in width. The ambulacral plates are generally compound; the pores unigeminal, increasing oftentimes in the vicinity of the peristome. The mouth opening is large, with deep incisions, and provided near the margins with well-developed auriculæ. The spines are frequently large and variable in shape.

HEMICIDARIS Agassiz.

HEMICIDARIS INTUMESCENS Clark.

Plate XII, Figs. 1*a–i*.

Determinative characters.—Test spheroidal, upper surface inflated, lower surface flat. Ambulacral areas moderately broad, increasing in width from the apical disk to the mouth edges. The tubercles at the peristome are nearly equal in size to those of the interambulacral areas, but become greatly reduced in passing from the ambitus to the apical disk. Interambulacral areas rather wide, with two rows of large tubercles. Miliary space wide, covered with numerous granules. Mouth opening moderately wide, with deep incisions.

Dimensions.—Height, ½ inch; transverse diameter, ¾ inch.

Description.—The very perfectly preserved molds of this species permit the taking in gutta-percha of all the details of form and structure, As the only representative of this genus in American deposits it possesses considerable interest. The test is of moderate size, with a convex and slightly inflated upper surface and nearly flat lower surface. The slightly flexuous ambulacral areas broaden from the region of the apical disk toward the ambitus and slightly contract again before the peristome is reached. The tubercles are prominent in the lower part of the column, where several pairs attain a size nearly equal to those of the interambulacral areas. Minute perforated granules succeed them above and continue as a double row to the apical disk. The poriferous zones are slightly flexuous, and the small pores are unigeminally arranged, although somewhat increased in the vicinity of the mouth edges.

The interambulacral areas are from three to four times the width of the ambulacral at the ambitus. The two rows of medium sized tubercles occupy the center of the plates; the areola is circular and slightly elevated; the boss deeply crenulated, and the mamelon distinctly perforated. There are about eight primary tubercles in each row. The apical disk is rather large, although not sufficiently well preserved to admit of a determination of the individual plates.

The mouth opening is small and occupies scarcely one-half of the diameter of the test. It is deeply notched, the lobes being nearly equal in size.

Related forms.—The present species of Hemicidaris is the only representative of the genus known from American deposits. A comparison with European species fails to identify it with any described forms.

Locality and geological horizon.—This species is from the Jurassic strata of Taylorsville, California.

Collection.—U. S. National Museum.

PSEUDODIADEMA Desor.

PSEUDODIADEMA EMERSONI Clark.

Plate XII, Figs 2*a–e*.

Determinative characters.—Test circular, depressed. Ambulacral areas straight and prominent; poriferous zones narrow; pores unigeminal. Interambulacral areas not quite twice the width of the ambulacral, with two rows of large tubercles, eight or nine in each row. Mouth opening wide.

Dimensions.—Height, ¼ inch; transverse diameter, ¾ inch (?).

Description.—The beautifully preserved molds of this interesting form were collected by Prof. Hyatt from the Jurassic beds of Taylorsville, California. The gutta percha casts from which the drawings were made represent very perfectly all the details of structure. The test is nearly circular, the prominent ambulacral areas giving it a slightly subpentagonal outline. The ambulacral areas are rather more than one-half the width of the interambulacral, and support two rows of primary tubercles somewhat smaller than the interambulacral tubercles. There are nine or ten in each row. Between the tubercles are numerous granules that are arranged in an undulating line between the rows and along the margin. They nearly disappear between the tubercles of the same series. Toward the apical disk the tubercles are greatly reduced in size. The pores are unigeminal, there being three or four opposite each ambulacral plate.

The interambulacral areas bear two rows of primary tubercles, eight or nine in each, that are only slightly larger than those of the ambulacral areas. They increase from the peristome to the ambitus, after which they rapidly decrease in size. The areolas are nearly confluent above and below, broader than long, and rise into prominent bosses that are not deeply crenulated. The mamelon is distinctly perforated. The miliary space is covered with granules of different sizes. There are no secondary tubercles developed near the mouth opening. The lower surface is flat, the mouth opening large and deeply notched; the ambulacral lobes larger than the interambulacral. The apical disk is not preserved.

Related forms.—As the only Pseudodiadema in the Jurassic of America it is unique, while its identity with any European form is very doubtful. It closely resembles *P. Baileyi*, from England, in many particulars, but it is a less depressed form, with more rounded sides and more numerous granules in the miliary space.

Locality and geological horizon.—This species is found in the Jurassic beds of Taylorsville, California, and is named in honor of Prof. B. K. Emerson, of Amherst College, from whom the writer received his first instructions in geology and paleontology.

Collection.—U. S. National Museum.

PSEUDODIADEMA DIATRETUM (Morton).

Plate XIII, Figs. 1*a–f*.

Cidaris diatretum Morton, 1833. Am. Jour. Sci., 1st ser., vol. 23, p. 294.

Cidarites diatretum Morton, 1834. Synop. Organ. Remains, Cretaceous, p. 75, Pl. 10, Fig. 10.

Cidaris diatretum Bronn, 1848, Index Pal., vol. 1, p. 298.

Pseudodiadema diatretum Desor, 1858. Synopsis des Échinides fossiles, p. 73.

Cidaris diatretum Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 18.

Pseudodiadema diatretum Cotteau, 1862–'67. Paléont. française, vol. 7, p. 519.

Pseudodiadema diatretum Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 2.

Pseudodiadema diatretum Conrad, 1868. Geol. of N. J., Appendix, p. 722.

Cidaris clavigera Credner, 1870. Zeitschr. d. deutsch. geol. Gesells., vol. 22, p. 218.

Cidaris sceptrifera Credner, 1870. Zeitschr. d. deutsch. geol. Gesells., vol. 22, p. 218.

Pseudodiadema diatretum Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test circular, convex above, concave below, sides inflated. Ambulacra wide, sinuous, with two rows of tubercles, that are large at the ambitus and decrease toward the poles; poriferous zones narrow, sinuous. Interambulacra with two rows of primary tubercles and several irregular rows of secondary tubercles. Mouth opening narrow, about one-third the diameter of the test.

Dimensions.—Height, ½ inch; transverse diameter, 1¼ inches.

Description.—The specimens of this species vary greatly in size, the full-grown forms being moderately large. The test is circular, depressed, slightly convex above, concave below. The sides are inflated (Pl. XIII, Fig. 1*b*).

The ambulacral areas are wide, slightly raised, and furnished with two rows of tubercles, thirteen to fourteen in each row. They are large and prominent at the ambitus, but decrease gradually toward the poles. The broad areolas, that are sharply depressed in their marginal portions, are striated by faint radial ridges on the outer sides. At the upper and inner angle of each plate is a small secondary tubercle, while irregularly scattered over the other portions of the plates are smaller tubercles, and between them minute granules. The poriferous zones are slightly flexed, the pores of each plate being disposed in curved form about the margin (Pl. XIII, Fig. 1*d*). Although there are generally three pairs of pores on each plate, four pairs are not infrequent near the ambitus (Pl. XIII, Fig. 1*e*).

The interambulacral areas are about one and one-half times the width of the ambulacral, and have two rows of tubercles somewhat larger than those of the latter. There are, in addition, several irregular rows of secondary tubercles, of various sizes, that are most numerous between the rows of primary tubercles and the poriferous zones. Sparsely scattered over the interambulacral space are flattened granules (Pl. XIII, Fig. 1*c*).

The primary tubercles of both the ambulacral and interambulacral areas have wide circular areolas, elevated and deeply crenulated bosses, and distinctly perforated mamelons (Pl. XIII, Fig. 1*f*).

The mouth opening is narrow, reaching scarcely one-third the diameter of the test. The incisions of the margin are weak (Pl. XIII, Fig. 1*a*).

The discal opening is subpentagonal.

Related forms.—This species resembles in some particulars *Pseudodiadema ornatum* Goldfuss, of the Cretaceous of Europe, but the latter form has a different arrangement of the secondary tubercles and granules and lacks the radial striation upon the areolas.

Locality and geological horizon.—*Pseudodiadema diatretum* is from the yellow limestone of the middle marl bed (upper Cretacous) of Timber creek, New Jersey.

Collections.—Philadelphia Academy of Natural Sciences; American Museum of Natural History, New York.

PSEUDODIADEMA TEXANUM (Roemer).

Plate XIII, Figs. 2*a–b*. Plate XIV, Figs. 1*a–g*.

Diadema texanum Roemer, 1852. Die Kreidebildungen von Texas, p. 82, Pl. 10, Fig. 5.
Pseudodiadema texanum Desor, 1858. Synop. des Échinides fossiles, p. 72.
Diadema texanum Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Pseudodiadema texanum Meek, 1864. Smith Misc. Coll. vol. 7 (177), p. 2.
Pseudodiadema Roemeri Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test small, circular, depressed; sides inflated; upper and lower surfaces about equally flattened. Ambulacra narrow, with two rows of primary tubercles, eleven or twelve in each row; poriferous zones narrow, pores unigeminal. Interambulacra wide, with two rows of primary tubercles of larger size than those of the ambulacra. Mouth opening wide, covering nearly one-half the diameter of the test. Discal opening subcircular, with deep incision in right anterior ambulacrum.

Dimensions.—Transverse diameter, $\frac{5}{8}$ inch; height, $\frac{3}{16}$ inch.

Description.—This form, described by Roemer, in 1852, as *Diadema texanum*, was assigned a new name (*P. Roemeri*) by the writer in his preliminary report,[1] when *Cyphosoma texanum* of the same author was referred to *Pseudodiadema*. The reference of the latter form to *Diplopodia*, in the present report, makes it possible to return to the earlier name for the present species.

The test is circular, very much depressed on both the upper and lower surfaces and inflated at the sides (Pl. XIV, Fig. 1*c*).

The ambulacral areas are narrow and lanceolate. They bear two rows of tubercles, eleven or twelve in each row, that decrease rapidly in size from the ambitus to the poles (Pl. XIV, Fig. 1*e*; Pl. XIII, Fig. 2*b*). The areolas are circular, the bosses stout and prominent, the mamelons distinctly perforated (Pl. XIV, Fig. 1*g*). Small secondary tubercles are irregularly dispersed between the rows of primary tubercles. A few scattered granules surround the same. The poriferous zones are unigeminal throughout, though the pores show a slight tendency to increase at the peristome.

The interambulacral areas are about twice the width of the ambulacral. There are two rows of primary tubercles, nine or ten in each row, that decrease in size from the ambitus to the poles (Pl. XIV, Fig. 1*d*; Pl. XIII, Fig. 2*a*). The areolas are depressed, circular, and distinctly outlined, the bosses elevated and deeply crenulated, the mamelons large and deeply perforated. Small secondary tubercles surround the primary tubercles, between which are interspersed minute granules (Pl. XIV, Fig. 1*f*).

The mouth opening is wide, covering nearly one-half of the diameter of the test. Ten incisions produce well-defined lobes at regular intervals (Pl. XIV, Fig. 1*b*). The discal opening is large and subcircular, with a deep incision in the right anterior ambulacrum (Pl. XIV, Fig. 1*a*).

Related forms.—Both Roemer and Desor mention the similarity of this species to *P. tenue*, cf the Cenomanian of Europe, from which, however, it is separated by its smaller tubercles and more numerous granules.

Locality and geological horizon.—This important species is common in the Fredericksburg formation of the Comanche series (lower Cretaceous) of Texas, and is found at Fredericksburg and near San Saba valley.

Collection.—U. S. National Museum.

DIPLOPODIA McCoy.

DIPLOPODIA TEXANUM (Roemer).

Plate XV, Figs. 1*a–f*; Plate XVI, Figs. 1*a–d*.

Diadema texanum Roemer, 1849. Texas, etc., p. 392.

Cyphosoma texanum Roemer, 1852. Die Kreidebildungen von Texas, p. 82, Pl. 10, Fig. 6.

Cyphosoma texanum Conrad, 1857. U. S. and Mex. Bound. Surv. Rept., vol. 1, pt. 2, p. 145, Pl. 1, Fig. 3.

Phymosoma texanum Desor, 1858. Synopsis des Échinides fossiles, p. 90.

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[1] Johns Hopkins University Circulars, 1891, No. 87, pp. 75–77.

Cyphosoma texanum Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 18.
Cyphosoma texanum Gabb, 1869. California Geol. Surv., Paleontology, vol. 2, p. 276.
Pseudodiadema texanum Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 75.

Determinative characters.—Test large, subcircular; sides inflated; upper surface elevated; lower surface depressed, concave. Ambulacra prominent, with two rows of primary tubercles; poriferous zones broad above, narrow below; pores in single pairs from peristome to ambitus, beyond which to the apical disk they are bigeminal. Interambulacra wide, with four rows of primary tubercles at the ambitus, which become reduced to two at the poles. Mouth opening wide, about two-fifths the diameter of the test. Discal opening large, subpentagonal.

Dimensions.—Transverse diameter, 1¾ inches; height, ⅞ inch.

Description.—This species was first described by Roemer, in 1849, in Texas, etc., as *Diadema texanum*, but subsequently, in 1852, referred to *Cyphosoma*. Although the perforated mamelons are not always shown with distinctness at the first glance, they are sufficiently numerous upon careful inspection to warrant the removal of this form from the genus *Cyphosoma*.

The test is large, subcircular and elevated (Pl. XV, Fig. 1*c*). The sides are inflated, and the upper surface elevated and convex. The base is depressed and concave.

The ambulacral areas are broad and lanceolate. They have two rows of primary tubercles, fourteen or fifteen in each series, that are large at the ambitus and decrease gradually toward the poles (Pl. XV, Fig. 1*d*). A circle of scattered granules surround the narrow areolas. The poriferous zones are broad upon the upper surface, but below the ambitus are very much narrowed. The pores are in single pairs below the ambitus, except directly at the mouth edges, where they become greatly increased, as shown in Plate XVI, Fig. 1*a*. From the ambitus to the apical disk they are bigeminal (Pl. XV, Fig. 1*e*), a character which Duncan, in his recent revision of the Echinoidea, considers of generic importance and sufficient ground for a separation of Diplopodia from Pseudodiadema.

The interambulacral areas are about one and one-half times the width of the ambulacral at the ambitus. There are four rows of primary tubercles at the ambitus (Pl. XV, Fig. 1*f*), which become reduced to two in the vicinity of the apical disk and mouth edges (Pl. XVI, Fig. 1*b*, 1*c*). In the center of the column the tubercles of the four rows are of about equal size, but those of the outer rows become much more rapidly reduced in size toward the poles. Small secondary tubercles are found on the outer margin of the plates, while irregularly scattered granules cover the space between the tubercles. A broad depression occurs along the line of the central suture in the vicinity of the discal opening.

The mouth opening is circular, but is broken by distinct incisions. Its diameter is about two-fifths that of the test (Pl. XV, Fig. 1*b*).

The discal opening is large and subpentagonal (Pl. XV, Fig. 1*a*).

Related forms.—This species is closely allied to or perhaps identical with the form described by D'Orbigny in 1842 from the United States of Colombia under the name of *Echinus Bolivarii*, and later recognized by Gabb in a collection obtained from Peru. As the original description and figures leave some doubt as to the determination of the species, the term *texanum* is retained here.

Locality and geological horizon.—This form is found in the Fredericksburg formation of the Comanche series (lower Cretaceous) of Texas. It is from the Comanche Peak beds, and is reported from Fredericksburg and near the head of the San Saba river.

Collections.—U. S. National Museum; Boston Society of Natural History; Texas Geological Survey; University of Iowa; Prof. Robt. T. Hill.

DIPLOPODIA HILLI Clark.

Plate XVI, Figs. 2*a–g*.

Pseudodiadema Hilli Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subpentagonal, depressed; sides inflated; upper and lower surfaces flattened. Ambulacra prominent, straight, with two rows of primary tubercles, twelve or thirteen in each row; poriferous zones narrow, with slight increase in width toward the apical disk; pores in single pairs below, but bigeminal on the upper surface. Interambulacra with two rows of primary tubercles of equal size with those of the ambulacra. Mouth opening narrow, circular. Discal opening broad, pentagonal.

Dimensions.—Transverse diameter, $\frac{3}{4}$ inch; height, $\frac{5}{16}$ inch.

Description.—This rare Diplopodia has a subpentagonal outline, the projecting ambulacra occupying the angles. It is depressed on both the upper and lower surfaces, the latter becoming somewhat concave toward the mouth opening. The sides are moderately inflated.

The ambulacra are broad, very prominent, and furnished with two rows of large tubercles, twelve or thirteen in each row, that decrease rapidly from the ambitus toward the apical disk and peristome. The poriferous zones are narrow and lanceolate. The pores are arranged in single pairs on the lower surface, but from the ambitus to the apical disk are increased slightly in number, and near the apical disk become bigeminal (Pl. XVI, Fig. 2*d*). The interambulacral areas are narrow and appear flattened, as compared with the slightly projecting ambulacra. They are provided with two rows of primary tubercles of equal size with those of the ambulacra (Pl. XVI, Fig. 2*f*). There are ten or eleven in each row. The areolas are narrow, circular, and elevated, the bosses prominent and distinctly crenulated, and the mamelons deeply perforated. The tubercles are somewhat widely separated and the intervening space is covered with small secondary tubercles and sparsely scattered granules.

The mouth opening is broad, depressed, and circular. It is divided by ten incisions into well-defined lobes, those of the ambulacra broader and extending farther into the opening than the others (Pl. XVI, Fig. 2*b*).

The distal opening is pentagonal, the angles occurring at the point of the medial suture of the interambulacra (Pl. XVI, Fig. 2*a*).

Related forms.—*Diplopodia Hilli* appears at first glance closely allied to, if not identical with, *Pseudodiadema texanum*. It is separated from the same, however, by its larger size, subpentagonal form, and increase in number of pores from the ambitus to the apical disk. In this latter particular it is not unlike *D. texanum*, from which, however, it is separated by its smaller size, subpentagonal form, and two instead of four rows of primary tubercles. It is similar to *P. Rhodani* of the European Cretaceous in some particulars, but that form is without the increase in number of pores on the upper surface and likewise possesses more plates in each column.

Locality and geological horizon.—This species is from the Austin chalk (upper Cretaceous) of Texas.

Collections.—U. S. National Museum; Prof. Robt. T. Hill.

COPTOSOMA Desor.

COPTOSOMA MORTONI (de Loriol).

Plate XVII, Figs. 1*a–e*.

Cyphosoma Mortoni de Loriol, 1887. Recueil Zoologique Suisse, Tome IV, No. 3, pp. 389–391, Pl. XVII, Fig. 2*a–c*.

Determinative characters.—Test circular, depressed. Ambulacra very wide, with two rows of primary tubercles, thirteen in each row, the three or four at the ambitus large and nearly confluent, but diminishing rapidly in size toward either pole; poriferous zones narrow, sinuous; pores unigeminal, those of each pair separated by a granule. Interambulacra with two rows of tubercles, nine or ten in each row. Mouth opening very large.

Dimensions.—Transverse diameter, ½ to ⅝ inch; height, ¼ inch.

Description.—The writer has been unable to obtain a specimen of this species, but the very full description and excellent figures given by de Loriol admit of its satisfactory identification. The description that follows is a translation in nearly every particular of that given by de Loriol. The two specimens in the possession of de Loriol were so deformed that he could not determine the height accurately. The test is circular and depressed. The ambulacral areas are relatively very wide, almost as large as the interambulacral, and bear two rows of large tubercles, thirteen in each row. The first four or five tubercles from the apical disk are far apart and very small. At the ambitus three or four of the tubercles are very large, with nearly confluent areolas (Pl. XVII, Fig. 1*c*), but rapidly diminish in size toward the lower surface, the last four or five being very small and with difficulty distinguished. The areolas, except at the ambitus, are not large.

The bosses are finely crenulated and the mamelons small and imperforate. Upon the lower surface there are large mammillated granules which can be with difficulty distinguished from the primary tubercles. Each areola is also partially surrounded by a circle of small granules that occur most numerously near the line of the central suture. The granules are few in number on the upper surface. The poriferous zones are narrow, slightly sinuous, and composed of small pores without any increase toward the apical disk or mouth opening. A small granule is found between the pores of each pair (Pl. XVII, Fig. 1*c*).

The interambulacral areas bear two rows of primary tubercles that are similar to those of the ambulacra, but larger and less numerous (Pl. XVII, Fig. 1*a*). The lower surface is covered by large mammillated granules that can scarcely be distinguished from the tubercles, and also by numerous small ones. There are few granules on the upper surface. The mouth opening is large, with slight incisions.

Related forms.—This species is most closely related to *Coptosoma speciosum*, but in form and in several details of structure is unlike it. The presence of granules between the pores of the present species is a marked feature.

Locality and geological horizon.—This form is from the Rotten limestone (upper Cretaceous) of Nahalak, Kemper county, Mississippi.

Collection.—P. de Loriol, Switzerland.

COPTOSOMA SPECIOSUM Clark.

Plate XVIII, Figs. 1*a*–*h*.

Cyphosoma speciosum Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test circular, inflated at the sides, flattened on the upper and lower surfaces. Ambulacra wide, with two rows of primary tubercles, twelve or thirteen in each, that gradually diminish in size toward the poles; poriferous zones sinuous; pores unigeminal. Interambulacra with two rows of tubercles slightly larger than those of the ambulacra. Mouth opening one-third the diameter of the test.

Dimensions.—Transverse diameter, $\frac{11}{16}$ inch; height, $\frac{3}{8}$ inch.

Description.—This delicate species has a circular test with inflated sides. Both poles are flattened, the lower more than the upper (Pl. XVIII, Fig. 1*b*).

The ambulacral areas are wide and prominent, and bear two rows of large tubercles, twelve or thirteen in each row. The areolas are nearly confluent above and below, and are striated by irregular radiating ridges (Pl. XVIII, Fig. 1*f*). The bosses are deeply crenulated, and the small mamelons are imperforate. Minute tubercles and granules irregularly surround the primary tubercles, occurring in greatest number along the central suture. The poriferous zones are slightly sinuous, the three pore pairs having a curved arrangement on each ambulacral plate.

The interambulacral areas are about one and one-half times as wide as the ambulacral. They have two rows of primary tubercles that are somewhat larger than those of the ambulacra (Pl. XVIII, Fig. 1*d*). The areolas are very large and are confluent above and below. Throughout the greater part of the column the two rows approach each other, but toward the apical disk are widely separated from one another. The smaller tubercles are disposed in rows, with greater or less regularity, on either side of the primary series.

The mouth opening is narrow, occupying a little more than one-third of the diameter of the test. It has an irregular pentagonal outline. The discal opening is large and pentagonal in form (Pl. XVIII, Fig. 1*a*).

Related forms.—This form is apparently closely related to *Coptosoma Mortoni*, but is more elevated and does not exhibit the granules between the pores.

Locality and geological horizon.—This species is from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collection.—Philadelphia Academy of Natural Sciences.

GONIOPYGUS Agassiz.

GONIOPYGUS ZITTELI Clark.

Plate XVIII, Figs. 2 *a–d*. Plate XIX, Figs. 1 *a–e*.

Goniopygus Zitteli Clark, 1891. Johns Hokins University Circulars, No. 87, p. 76.

Determinative characters.—Test subconoidal, circular in circumference; upper surface elevated; base flattened. Ambulacra broad, with a double row of alternating tubercles, eighteen to twenty in each series; poriferous zones, with a double row of pores, multiplied at the peristome. Interambulacra broader than the ambulacra, with a double row of primary tubercles, ten to twelve in each row. Apical disk prominent, compact. Mouth opening large, with shallow incisions.

Dimensions.—Transverse diameter, 1½ inches; height, 1 inch.

Description.—All the specimens of this species examined by the writer have a distinctly subconical form that is highly characteristic. The upper surface is very much elevated, while the lower is flat and slightly depressed around the mouth edges (Pl. XVIII, Fig. 2*a*).

The ambulacral areas are broad, increasing regularly in width from the apical disk to the ambitus, beyond which they decrease toward the mouth opening (Pl. XIX, Fig. 1*d*). There is a double row of eighteen to twenty tubercles in each area, that rapidly increase in size from the apical disk downward. The pores are arranged in a double row on each poriferous zone except in the vicinity of the mouth edges, where they become suddenly increased in number (Pl. XVIII, Fig. 2 *b*).

The interambulacral areas are about one and one-half times the width of the ambulacral, and each contains a double row of large tubercles, ten to twelve in each series (Pl. XIX, Fig. 1*c*). These tubercles are considerably larger than those of the ambulacral area, and have wide circular areolas, smooth bosses, and imperforate mamelons (Pl. XVIII, Fig. 2*c*). On the base the tubercles of all the areas are of nearly equal size. The miliary space is wide, very nearly smooth in the upper portions of the column, and sparsely covered with granules toward the mouth edges.

The apical disk is large and compact, the elongated genital plates giving it a star-shaped appearance (Pl. XVIII, Fig. 2*d*). The well-defined ocular plates, wedged into the interspaces, make the entire outline subpentagonal. Each genital plate is angular at the outer extremity and perforated. On the inner edge of the same there is a semicircular depression, in the center of which is a small mammillated tubercle.

The mouth opening is large, covering quite one-half the diameter of the base. It is divided into ten lobes by ten shallow incisions (Pl. XIX, Fig. 1*b*).

Related forms.—This species shows many points of similarity to *Echinus patagonensis*, described by d'Orbigny in 1842, from the Tertiary of southern Patagonia. The margin of d'Orbigny's species is sharper and the apical disk of somewhat different shape. Moreover, if properly referred to the Tertiary, it is undoubtedly a different form. *Echinus andinus*, from the desert of Atacama, described by Philippi in 1860, is likewise closely allied to *G. Zitteli*, though more conical and presenting a different surface decoration of the plates. *Goniopygus major*, from the Cenomanian of Europe, is similar in many particulars, though the pores are not increased around the peristome as in *G. Zitteli*, and the apical disk is of more compact form.

Locality and geological horizon.—*Goniopygus Zitteli* is from the Caprina limestone, a division of the Fredericksburg formation of the Comanche series (lower Cretaceous), and has been collected at many points in Texas, among others Spanish Oak branch, Williamson county, and Round Rock.

Collections.—U. S. National Museum; Texas Geological Survey.

ECHINIDÆ.

Test spheroidal. Ambulacra wide, with two or more rows of primary tubercles; poriferous zones usually trigeminal or polygeminal. Interambulacra with two or more rows of primary tubercles, generally of equal size with those of the ambulacra. Mouth opening large, decagonal. Apical disk composed of ten plates.

PSAMMECHINUS Agassiz.

PSAMMECHINUS CINGULATUS Clark.

Plate xx, Figs. 1*a*–*i*.

Psammechinus cingulatus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test small, hemispherical, with circular circumference; sides inflated; upper surface elevated; base flattened and concave. Ambulacra wide, with two rows of primary tubercles, sixteen or seventeen in each series; poriferous zones depressed, trigeminal. Interambulacra about one and one-half times the width of the ambulacra; plates covered with numerous uncrenulated and imperforate tubercles. Mouth opening large, with ten deep incisions.

Dimensions.—Transverse diameter, ⅞ inch; height, ½ inch.

Description.—This delicate form, of which two very perfect specimens were examined by the writer, is hemispherical in shape with circular circumference, inflated sides, elevated upper surface, and flattened base. In the vicinity of the mouth opening the lower surface is depressed, producing a slight concavity.

The ambulacral areas are wide and composed of eighteen to twenty plates (Pl. xx, Fig. 1*f*). The lower sixteen or seventeen of each series bear prominent tubercles that occur in a continuous line to the peristome. On either side of the primary tubercles are smaller ones of like shape. The three pore pairs are arranged in semicircular form, the two upper separated from the lower by one of the secondary tubercles (Pl. xx, Fig. 1*g*).

The interambulacral areas are about one and one-half times as wide as the ambulacral and the plates about fifteen in number. Each plate bears a large tubercle in the center, and irregularly arranged about it smaller tubercles of various sizes (Pl. xx, Fig. 1*e*).

The mouth opening is large, with ten deep incisions (Pl. xx, Fig. 1*h*). The apical disk is lacking, but the broken opening is large and pentagonal in form.

Related forms.—This unique species is quite unlike any hitherto described, and is readily characterized by the arrangement of the tubercles and pore pairs. As the only representative of this genus recognized in American deposits it has especial interest.

Locality and geological horizon.—This species is labeled as simply from New Jersey, but in character of preservation is not unlike other specimens from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek.

Collection.—Philadelphia Academy of Natural Sciences.

STOMECHINUS Desor.

STOMECHINUS HYATTI Clark.

Plate XXIII, Figs. 1*a*–*e*.

Determinative characters.—Test high, circumference circular. Ambulacra with four rows of small primary tubercles; poriferous zones wide, trigeminal. Interambulacra with eight or ten rows of tubercles that diminish in number toward apical disk and mouth opening, with a depression along the line of the central suture.

Dimensions.—Height, 1 inch; transverse diameter, 1 inch.

Description.—The single specimen of this interesting Jurassic form has only the cast of a portion of the exterior preserved. The test is high, and the circumference circular or slightly subpentagonal. The sides rise abruptly from the margin (Pl. XXIII, Fig. 1*a*).

The ambulacral areas are about one-half the width of the interambulacral, and preserve a nearly uniform width throughout. There are four rows of tubercles that increase slightly in size from above downward. A depression appears along the line of the central suture. The poriferous zones are wide; the pore pairs are placed in oblique ranks of three, and each rank is separated from that next to it by two small tubercles (Pl. XXIII, Fig. 1*b*).

The interambulacral area is about twice the width of the ambulacral, and the plates of the former are but slightly higher than those of the latter (Pl. XXIII, Fig. 1*c*). Each plate is covered at the widest part of the area with an irregular row of four or five tubercles that are of about equal size. The tubercles of the interambulacral areas are of about the same size as those of the ambulacral. The tubercles are uncrenulated and imperforate. A wide depression extends along the medial line of each interambulacral area according with the position of the central suture.

The regions of the apical disk and mouth opening are largely wanting, but a deep incision shown upon the margin of the latter indicates that it is distinctly lobed throughout.

Related forms.—The American species shows some points of identity with *Stomechinus nudus* Wright of England, though the latter is less elevated, has a sharper marginal angle, and a less regular arrangement of the tubercles.

Locality and geological horizon.—This species is from the Jurassic strata of Taylorsville, California.

Collection.—U. S. National Museum.

PEDINOPSIS Cotteau.

PEDINOPSIS PONDI Clark.

Plate XXI, Figs. 1*a–b*. Plate XXII, Figs. 1*a–c*.

Determinative characters.—Test large, circular, inflated at the sides, convex on the upper surface. Ambulacra with six rows of tubercles at the ambitus, the two marginal rows complete and the four inner incomplete; poriferous zones broad, bigeminal. Interambulacra with twenty rows of tubercles at the ambitus, which become reduced to four at the margin of the mouth opening; tubercles small, equal, crenulated, and perforated. Mouth opening small, with distinct incisions.

Dimensions.—Transverse diameter, 3½ inches; height, 2¼ inches.

Description.—The single very large specimen of this species examined by the writer has portions of the test in a very perfect state of preservation. The test is large, circular, inflated at the sides, and convex on the upper surface. The lower surface is flattened, with a slight concavity in the region of the mouth opening (Pl. XXII, Fig. 1*a*). The ambulacral areas are wide, and have at the ambitus six rows of tubercles (Pl. XXII, Fig. 1*c*), the two marginal rows alone continuing from the discal opening to the peristome. The four inner rows are incomplete, but of equal size with the outer. The tubercles are finely crenulated and perforated. The poriferous zones are broad and bigeminal (Pl. XXII, Fig. 1*c*), except on the lower surface, where the rows become crowded together. Near the mouth opening they again broaden out and become greatly increased in number at the margin. The pores are small and round. The interambulacral areas are broad and have twenty rows of tubercles at the ambitus, which become reduced to four at the mouth edges (Pl. XXII, Fig. 1*b*). The tubercles are of equal size with those of the ambulacra. Small mammillated granules are found scattered over both the ambulacral and interambulacral plates, together with a fine granulation covering the entire surface.

The mouth opening is small and measures about seven-eighths of an inch in diameter. It has ten distinct incisions in the interambulacra. The discal opening is partially outlined, but is very indistinct.

This species is named for Mr. Edwin J. Pond, of the U. S. Coast and Geodetic Survey, by whom the specimen described by the writer was discovered.

Related forms.—The present species is unlike any described from American or European deposits.

Locality and geological horizon.—The specimen was found on the south bank of Onion creek, Travis county, Texas, about one-fourth mile southwest of the crossing of the Austin and San Antonio wagon road. It is probably from the lower portion of the Austin chalk (upper Cretaceous).

Collection.—Johns Hopkins University.

IRREGULARES.

ECHINOCONIDÆ.

Test circular, elliptical, or pentagonal. Ambulacra narrow; poriferous zones unigeminal, seldom bigeminal. Interambulacra broad; surface covered with small, perforated, and crenulated tubercles, that are larger on the base. Mouth opening central, circular, or decagonal, with jaws and distinct incisions. Apical disk central, composed of ten plates. Anal opening between apical disk and mouth opening.

HOLECTYPUS Desor.

HOLECTYPUS PLANATUS Roemer.

Plate XXIII, Fig. 2*a–f*.

Holectypus planatus Roemer, 1849. Texas, etc., p. 393.
Holectypus planatus Roemer, 1852. Die Kreidebildungen von Texas, p. 84, pl. 10, Fig. 2.
Holectypus planatus Shumard, 1852. Rept. Expl. Red River of La., p. 211.
Holectypus planatus Giebel, 1853. Jahresber. d. Naturw. Ver. in Halle, p. 373.
Holectypus planus Giebel, 1853, ibid.
Holectypus planatus Conrad, 1857. U. S. and Mex. Bound. Surv. Rept. vol. 1, pt. 2, p. 145, pl. 1, Fig. 4.
Holectypus planatus Desor, 1858. Synop. des Échinides fossiles, p. 174.
Holectypus planatus Gabb, 1860. Cat. Invert. Fossils, Cretaceous, p. 18.
Holectygus planatus Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 2.
Holectypus planatus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subcircular, subconical, flattened on the under surface. Ambulacra narrow, straight, and somewhat lanceolate, with six irregular rows of tubercles; poriferous zones straight, narrow, unigeminal. Interambulacra wide, plates numerous and narrow, each with a nearly horizontal row of small tubercles. Apical disk small, the madreporite large. Mouth opening small, subcircular. Anal opening large.

Dimensions.—Height, ¾ inch; transverse diameter, 1⅜ inches.

Description.—This very common form, from the Cretaceous of Texas, was first reported by Roemer in "Texas," etc., in 1849, and subsequently, in 1852, more accurately defined and figured. Although wide differences in outline and in the size and arrangements of the tubercles occur, they appear to be rather individual than specific. The majority of the specimens are subcircular; in the case of some, however, distinctly circular, while in that of others clearly pentagonal. The ambitus in some individuals is sharp, in others, rounded, while the upper surface is distinctly elevated at the center with slightly tumid sides. The under surface is flat and slightly depressed in the vicinity of the mouth opening.

The ambulacral areas are narrow, straight, increasing in width toward the ambitus and somewhat lanceolate in form. The poriferous zones are narrow, the pores small and unigeminal. Six rows of small tubercles are found in the broader portion of the areas, which become reduced to four toward the apical disk and mouth edges (Pl. XXIII, Fig. 2*e*).

The interambulacral areas are about three times the width of the ambulacral at the ambitus. The plates are narrow, each with a horizontal row of small tubercles, five or six in a row at the ambitus, but fewer above and below. Each tubercle has a small circular areola, crenulated boss, and perforated mamelon. The tubercles cover the greater portion of the plates, with minute granules interspersed between them (Pl. XXIII, Fig. 2*d*). The tubercles are very much larger on the lower surface, and the difference in size shown between those of the ambulacra and interambulacra on the upper surface disappears.

The apical disk is small. The five ovarial plates are all perforated; the madreporite is of large size and indistinctly separated from the other plates (Pl. XXIII, Fig. 2*f*).

The mouth opening is small, with slight incisions that give a decagonal margin. The large oval anal opening extends from the vicinity of the mouth edges to the ambitus (Pl. XXIII, Fig. 2*b*).

Related forms.—Cotteau has recently described, under the name of *H. Castilloi*, a new species of *Holectypus* from Mexico that is not unlike certain individuals of *H. planatus* examined by the writer. As a sufficient number of intermediate forms has been found to connect all the specimens examined with the type form described by Roemer, no attempt has been made to establish new species. *H. planus* described by Giebel is considered such a variation.

Locality and geological horizon.—This widely distributed form is from the Washita formation of the Comanche series (lower Cretaceous) of Texas. It has been found at Austin, Fredericksburg, and elsewhere.

Collections.—U. S. National Museum; Philadelphia Academy of Natural Sciences; Boston Society of Natural History; Texas Geological Survey; Prof. Robt. T. Hill.

CASSIDULIDÆ AGASSIZ.

Test circular, oval or subpentagonal. Ambulacra simple or petaloid, generally similar. Mouth opening central or subcentral, generally with a pentapetaloid floscelle. Anal opening excentric.

PYRINA Desmoulins emend. de Loriol.

PYRINA PARRYI Hall.

Plate XXIV, Figs. 1*a*–*k*.

Pyrina Parryi Hall, 1857. U. S. and Mex. Bound. Surv. Rept., vol. 1, pt. 2, p. 144, Pl. 1, Fig. 1–1*d*.

Pyrina Parryi Gabb, 1859. Cat. Invert. Fossils Cretaceous, p. 19.

Pyrina Parryi Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 2.

Pyrina Parryi Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subpentagonal, broader anteriorly than posteriorly, inflated at the sides, flattened above and below.

Ambulacral areas narrow, unigeminal; both areas covered with minute tubercles.

Mouth opening large, elliptical, oblique. Anal opening oval, supramarginal.

Dimensions.—Length, 1¼ inches; height, ⅝ inch.

Description.—The two specimens originally described by Hall, in the Mexican Boundary Survey Reports, are the only representatives of this interesting species that have been examined by the writer. The test is regular and symmetrical, slightly pentagonal in outline, enlarged anteriorally, contracted posteriorly. The upper surface is convex, though somewhat flattened at the summit. The sides are inflated, the base flattened and slightly depressed in the vicinity of the mouth opening (Pl. XXIV, Figs 1*c*, 1*d*).

The ambulacral areas are narrow and lanceolate; the poriferous zones straight and depressed, the pores small, oval, and unigeminal (Pl. XXIV, Fig. 1*f*). The interambulacral areas are broad and less elevated than the ambulacral. Both the ambulacra and interambulacra support numerous small tubercles, that are larger and more distinct on the lower than the upper surface. Fine microscopic granules are disseminated between the tubercles (Pl. XXIV, Figs. 1*e*, 1*g*).

The mouth opening is large, elliptical, and obliquely situated slightly in front of the center of the base. The anal opening is oval and placed nearly in the center of the posterior margin. The apical disk is small, composed of four ovarial plates, the large right antero-lateral modified to form the madreporite. The five small ocular plates are firmly wedged between the ovarial plates (Pl. XXIV, Fig. 1*h*).

Related forms.—The species just described is the only representative of this genus reported from American strata, and both in form and structural features admits of a ready separation from all European species. It presents some points of similarity with *Pyrina Desmoulinsii* D'Archiac, but is broader posteriorly and less elevated.

Locality and geological horizon.—*Pyrina Parryi* Hall is from the Washita formation of the Comanche series (lower Cretaceous), and in vol. I of the United States and Mexican Boundary Survey Reports is reported from Leon Springs, El Paso Road, Texas.

Collection.—U. S. National Museum.

BOTRIOPYGUS D'Orbigny.

BOTRIOPYGUS ALABAMENSIS Clark.

Plate XXV, Figs. 1*a*–*f*.

Botriopygus alabamiensis **Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.**

Determinative characters.—Test oblong; more or less depressed on upper surface, highest anteriorly; under surface concave. Ambulacra broad, lanceolate; poriferous zones subpetaloidal above. Interambulacral plates covered with numerous, irregularly distributed tubercles. Apical disk anteriorly situated. Mouth opening small, oblique, forward of the center.

Dimensions.—Length, 2½ inches; width, 2⅛ inches; height, 1 inch.

Description.—The single imperfectly preserved specimen of this species, although apparently lacking some of the characteristics of *Botriopygus*, is nevertheless referred to that genus. The test is oblong, considerably depressed on the upper surface, and concave on the base. The apex of the upper surface is forward of the center, making the anterior margin full, the posterior flattened (Pl. XXV, Fig. 1*c*).

The ambulacral areas are broad and lanceolate. They contract appreciably just above the ambitus, giving to the poriferous zones a subpetaloidal form. The pores of the subpetaloidal portions are large and oval, those of the outer rows more elongated than those of the inner and acuminated on their inner margins. The pores of each pair are united by a furrow. The inner portions of ambulacral plates are covered with tubercles that in the broadest portion of the subpetaloidal areas reach five or six in number (Pl. XXV, Fig. 1*c*). Below the subpetaloidal areas the pores recede from the outer margin of the plates. Those of each pair are close together, small, and nearly round. The plates also become broader (Pl. XXV, Fig. 1*d*).

The interambulacral plates are large and covered with numerous, irregularly arranged tubercles. A microscopic granulation covers the intertubercular space (Pl. XXV, Fig. 1*f*).

The position of the apical disk is forward of the center of the upper surface, although none of the plates are preserved on the specimen examined. The mouth opening is small and obliquely placed slightly in front of the center of the base.

Related forms.—Gabb describes a species of *Botriopygus* from Peru under the name of *B. elevatus* that is not unlike *B. alabamensis* in many particulars, though the American species is larger, less rounded anteriorly, and has a more depressed posterior margin.

Locality and geological horizon.—This form is from the Ripley group (upper Cretaceous) of Alabama. Its exact locality is unknown.

Collection.—Philadelphia Academy of Natural Sciences.

ECHINOBRISSUS Breyn.

ECHINOBRISSUS EXPANSUS Clark.

Plate XXVI, Figs. 1*a*–*g*.

Echinobrissus expansus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subquadrate, broader posteriorly, moderately convex on upper surface, concave on the base. Ambulacra narrowly lanceolate. Anal opening large, supramarginal; anal sulcus broad, deep, extending from near the apex to the ambitus. Mouth opening large, situated in front of the middle of the base.

Dimensions.—Length, 1⅛ inches; width, 1⅛ inches; height, ½ inch.

Description.—This typical Echinobrissus is of moderate size, somewhat depressed above, and subquadrate in marginal outline. The posterior portion is broader than the anterior and distinctly lobed. The base is concave.

The ambulacral areas are narrowly lanceolate, and on the upper surface the poriferous zones are subpetaloidal (Pl. XXVI, Fig. 1*a*). The inner rows of pores are round, the outer oval, with acuminated inner margins and obliquely placed (Pl. XXVI, Fig. 1*f*). The interambulacral areas are formed of broad plates that bear numerous small perforated and mammillated tubercles. A microscopic granulation covers the miliary space (Pl. XXVI, Fig. 1*e*).

The apical disk is small and compact and the perforations of the genital plates distinct (Pl. XXVI, Fig. 1*g*).

The mouth opening is large, excentric, situated at some distance in front of the center of the base. The anal opening is large, acuminated on the upper margin, and placed in a broad, deep anal sulcus that extends from near the apical disk to the posterior margin (Pl. XXVI, Fig. 1*d*).

Related forms.—*Echinobrissus expansus* has no points that would closely ally it with any species of this genus hitherto described.

Locality and geological horizon.—This species is from the Ripley group (upper Cretaceous) of Alabama or Mississippi, but its exact locality is not recorded.

Collection.—Philadelphia Academy of Natural Sciences.

ECHINOBRISSUS TEXANUS Clark.

Plate XXVI, Figs. 2*a–f*.

Echinobrissus texanus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test ovate, rounded anteriorly, subquadrate posteriorly; upper surface convex, apex forward of the center; base concave. Ambulacra lanceolate, subpetaloidal. Apical disk forward of the center. Mouth opening small, excentric. Anal opening small, oval, in narrow sulcus that begins some distance below the apical disk.

Dimensions.—Length, ¾ inch; width, ⅝ inch; height, $\frac{5}{16}$ inch.

Description.—The single specimen of this species is somewhat damaged on the sides, so that the ambital outline is not complete. It is ovate in form, broader posteriorly, and subquadrate. The upper surface is convex, but more or less compressed. The lower surface is concave.

The ambulacral areas are narrowly lanceolate. The poriferous zones for a short distance from the apical disk are subpetaloid in form. The posterior ambulacra are much longer than the others, the unpaired ambulacrum being the shortest. The pores of each plate are oval and set at an angle to one another (Pl. XXVI, Fig. 2*e*).

The interambulacral plates are large and covered with irregularly arranged tubercles. Between the tubercles a microscopic granulation covers the surface (Pl. XXVI, Fig. 2*f*).

The apical disk is small and situated forward of the apex. The individual plates can not be fully distinguished on the specimen examined. The mouth opening is apparently small, though somewhat obscured. It is situated forward of the center of the base.

The anal opening is small, placed in a narrow sulcus that begins some distance posterior to the apical disk.

Related forms.—*Echinobrissus texanus* is readily separated from *E. expansus* by its ovate form and the shape and size of the anal sulcus. It is unlike any European species.

Locality and geological horizon.—This form is from the Austin chalk (upper Cretaceous) of the south bank of the Colorado river, Austin, Texas.

Collection.—U. S. National Museum.

TREMATOPYGUS d'Orbigny.

TREMATOPYGUS CRUCIFER (Morton).

Plate XXVII, Figs. 1*a*–*i*.

Ananchytes cruciferus Morton, 1830. Am. Jour. Sci., 1st ser., vol. 18, p. 245, Pl. 3, Fig. 8.
Ananchytes cruciferus Morton, 1830. Philadelphia Acad. Nat. Sci., 1st ser., vol. 6, pp. 201, 202.
Nucleolites crucifer Morton, 1833. Am. Jour. Sci., 1st ser., vol. 23, p. 294.
Nucleolites crucifer Morton, 1834. Synop. Organ. Remains, Cretaceous, p. 75, Pl. 3, Fig. 15.
Nucleolites cruciferus Agassiz, 1840. Cat. Syst., p. 4.
Nucleolites cruciferus d'Orbigny, 1847. Prodrome, vol. 2, p. 271, Étage 22, No. 1197.
Nucleolites cruciferus Agassiz and Desor, 1847. Cat. rais., p. 97.
Nucleolites crucifer Bronn, 1848. Index Pal., vol. 1, p. 818.
Pygorhynchus crucifer Ravenel, 1850. Am. Assoc. Adv. Sci. Proc., p. 160.
Trematopygus crucifer d'Orbigny, 1853–'60. Paléont. française, vol. 6, p. 387, Pl. 953, Figs. 10, 11; Pl. 963, Figs. 1–5.
Echinobrissus cruciferus d'Orbigny, 1854. Revue zool., p. 25.
Nucleolites crucifer Desor, 1858. Synop. des Échinides fossiles, p. 262.
Nucleolites crucifer Gabb, 1859. Cat. Invert. Fossils Cretaceous, p. 19.
Nucleolites crucifer Meek, 1864. Smith Misc. Coll., vol. 7 (177), p. 2.
Nucleolites crucifer Cook, 1868. Geol. of New Jersey, p. 377.
Nucleolites crucifer Conrad, 1868. Geol. of New Jersey, App., p. 722.
Nucleolites cruciferus Credner, 1870. Zeitschr. d. deutsch. geol. Gesells., XXII, p. 217.
Trematopygus crucifer Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test ovate, inflated at the sides and base and slightly contracted anteriorly. Ambulacra long, well defined; pores unigeminal, prominent on the upper surface, indistinct on the base. Apical disk situated anteriorly. Mouth opening large and oblique. Anal opening large, oval, supramarginal.

Dimensions.—Length, 1 inch; breadth, $\frac{7}{8}$ inch; height, $\frac{9}{16}$ inch.

Description.—This urchin is not uncommon at Timber creek, New Jersey, where many very perfect specimens have been obtained. Its outline is ovate and very regular, lacking at the ambitus or apex any sharply defined angularity. The sides are highly inflated, together with the outer portion of the base.

The ambulacral areas are long, lanceolate, and unequal; the posterior pair are the longest, the unpaired anterior area is the shortest. The areas do not produce any irregularity in the outline of the test beyond inconsiderable depressions in the immediate vicinity of the mouth edges. The poriferous zones are clearly marked on the upper surface, and the pore pairs are nearly horizontal (Pl. XXVII, Fig. 1*f*), but toward the ambitus the pores become smaller, those of each pair nearer together, and the pairs obliquely situated at the lower, outer corner of each plate (Pl. XXVII, Fig. 1*e*); near the mouth edges they again become larger and slightly increased in number.

The interambulacral areas are wide and composed of large plates that are bent in the middle. The surface is covered with irregular rows of tubercles that are perforated and mammillated. The miliary space in its turn is covered with numerous minute and irregularly distributed granules.

The apical disk is small and anteriorly situated; the four genital plates are distinctly perforated, those of the anterior pair situated much nearer together than those of the posterior (Pl. XXVII, Fig. 1*g*).

The mouth opening is large, oblique, and placed somewhat forward of the center of the base. The anal opening is large, oval, and acuminate at the upper extremity. It is situated in an anal sulcus, that makes a marked indentation in the posterior margin, and is bordered by two well defined ridges (Pl. XXVII, Fig. 1*d*).

Related forms.—*Trematopygus crucifer* (Morton) is a unique species that affords no closely allied forms in either American or European deposits. It is the single representative of this genus recorded from American strata.

Locality and geological horizon.—The only specimens of this form thus far reported are from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collections.—American Museum of Natural History, New York; Philadelphia Academy of Natural Sciences; Johns Hopkins University.

CATOPYGUS Agassiz.

CATOPYGUS OVIFORMIS Conrad.

Plate XXVII, Figs. 2*a–f*.

Catopygus oviformis Conrad, 1847. Philadelphia Acad. Nat. Sci. Jour., 2d ser., vol. 2, p. 39, Pl. 1, Fig. 9.

Nucleolites oviformis (Catopygus) Conrad, 1868. Geol. of New Jersey, App., p. 722.

Catopygus oviformis Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test ovate, broader posteriorly; upper surface nearly flat; apex posterior to apical disk. Ambulacra narrow, subpetaloidal. Interambulacra wide; single interambulacrum elevated.

Apical disk excentric, nearer the anterior border. Mouth opening small, excentric, nearer the anterior margin. Anal opening oval, situated in a narrow sulcus, that terminates above in a projecting arch.

Dimensions.—Length, $\frac{7}{8}$ inch; width, $\frac{3}{4}$ inch; height, $\frac{7}{16}$ inch.

Description.—The test of this very beautiful little form is ovate, with rounded, inflated sides and elevated upper surface. The base is nearly flat, slightly concave in the vicinity of the mouth edges, and lobed posteriorly.

The ambulacral areas are narrowly lanceolate, subpetaloidal on the upper surface, the two posterior areas being much longer than the others. The plates in the petaloidal portions are narrow, but beyond increase in breadth (Pl. XXVII, Fig. 2*e*).

The large interambulacral plates are covered with minute tubercles, between which are numerous microscopic granules.

The apical disk is small, excentric, and situated far anterior to the apex (Pl. XVII, Figs. 2*a*, 2*c*).

The mouth opening is small and situated nearer the anterior margin.

The anal opening is oval and placed at the upper part of a nearly vertical anal sulcus. The upper margin of this sulcus forms a beak-shaped prominence that overhangs the opening (Pl. XXVII, Fig. 2*d*).

Related forms.—It is separated from *C. pusillus* Clark, the other American species, by its narrower outline, more inflated sides, and the anterior position of its apical disk. In form it is somewhat like *C. columbarius*, which is widely distributed in the Cenomanian of Europe, but the position of the apical disk at once distinguishes it.

Locality and geological horizon.—This species is from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collection.—Philadelphia Academy of Natural Sciences.

CATOPYGUS PUSILLUS Clark.

Plate XXVII, Figs. 3*a–d*.

Catopygus pusillus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test ovate to subquadrate, rounded anteriorly, subquadrate posteriorly, broader behind than before; upper surface elevated; base concave. Ambulacra narrowly lanceolate, subpetaloidal on the upper surface. Apical disk small, nearly central. Mouth opening small, anteriorly placed. Anal opening oval, in vertical sulcus beneath overhanging arch.

Dimensions.—Length, $\frac{5}{8}$ inch; width, $\frac{9}{16}$ inch; height, $\frac{3}{8}$ inch.

Description.—All the specimens of this species examined by the writer are casts, that are, however, sufficiently well preserved to admit of the determination of all the more important characters. The test is ovate to subquadrate, occasioned by the slight angularity of the posterior margin. The anterior portion is regularly rounded.

The ambulacral areas are narrow, the posterior pair only slightly longer than the anterior.

The interambulacral areas are wide and composed of large plates.

The apical disk is small and situated nearly in the center of the upper surface.

The mouth opening is small and placed forward of the center of the base. The anal opening is situated in a nearly vertical sulcus that is overhung at its upper extremity by a projecting arch (Pl. XXVII, Fig. 3*c*).

Related forms.—*Catopygus pusillus* is separated from *C. oviformis* by its broader and slightly subquadrate form, less rounded sides, and nearly central position of the apical disk.

Locality and geological horizon.—*Catopygus pusillus* is from the lower marl bed (upper Cretaceous) of Wordills, Monmouth county, New Jersey.

Collection.—U. S. National Museum.

CASSIDULUS Lamarck.

CASSIDULUS FLOREALIS (Morton).

Plate XXVIII, Fig. 1*a–l*.

Clypeaster sp. Morton, 1830. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 202.
Clypeaster florealis Morton, 1833. Amer. Jour. Sci., 1st ser., vol. 23, p. 294.
Clypeaster florealis Morton, 1834. Synop. Organ. Remains Cretaceous, p. 76, Pl. 3, Fig. 12, and Pl. 10, Fig. 12.
Pygurus florealis Agassiz and Desor, 1847. Cat rais., p. 141.
Clypeaster florealis Bronn, 1848. Index Pal., p. 312.
Faujasia florealis d'Orbigny, 1853–'60. Paléont. française, vol. 6, p. 319, Pl. 920, Figs. 5, 6.
Faujasia florealis Desor, 1858. Synop. des Échinides fossiles, p. 318.
Clypeaster florealis Gabb, 1859. Synop. Invert. Fossils, Cretaceous, p. 18.
Cassidulus florealis Meek, 1864. Smith Misc. Coll., vol. 7 (177), p. 2.
Pygurus florealis Conrad, 1868. Geol. of New Jersey, App., p. 722.
Cassidulus florealis Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subconoidal in outline, subpentagonal, slightly longer in the antero-posterior diameter than the lateral, rounded anteriorly, angular posteriorly; apex slightly forward of the center. Ambulacra narrow; poriferous zones petaloidal on the upper two-thirds of the dorsal surface. Interambulacra wide, covered with small perforated tubercles. Apical disk small, situated anteriorly. Mouth opening pentagonal, with well-developed floscelle. Anal opening supramarginal, in short, narrow sulcus.

Dimensions.—Length, 1⅜ inches; breadth, 1¼ inches; height, ¾ inch.

Description.—This species, the earliest of this genus recognized from American deposits, has a subconoidal test of moderate height, with a subpentagonal margin. The angularity is more pronounced posteriorly than anteriorly, the anterior portion of the margin being distinctly rounded. The antero-posterior diameter is but slightly greater than the lateral, while the height is a little more than one-half of the same. The apex is a short distance in front of the center of the upper surface, the slope of the anterior face being sharper than the posterior (Pl. XXVIII, Fig. 1*c*).

The ambulacral areas are narrow. The poriferous zones consist of a double row of pores that are arranged in petaloidal form on the upper two-thirds of the dorsal surface, and as phylloidal expansions in the vicinity of the mouth edges (Pl. XXVIII, Fig. 1*e*). In the petaloidal portion the pores of the inner row are oval, those of the outer elongated, and each pair united by a shallow furrow (Pl. XXVIII, Fig. 1*f*). Toward the margin the pores are smaller and placed near together (Pl. XXVIII, Fig. 1*g*), and so continue until near the peristome, when the poriferous zones suddenly expand. At this point the pores increase in size and distance from one another. Between the oral lobes the poriferous zones again suddenly contract.

The interambulacral areas are of unequal width; the anterior pair are the narrowest; the three posterior are of about equal width and nearly one-half wider than the anterior. The surface of the plates is irregularly covered with numerous small perforated tubercles with sunken areolas, between which are numerous microscopic granules (Pl. XXVIII, Fig, 1*i*).

The apical disk is composed of four perforated genital and five small ocular plates. The fifth genital is apparently obsolete, as it could not be observed on any of the several very perfect specimens examined. The large right antero-lateral genital plate, the madreporite, extends across the disk, forming a large portion of the center of that body (Pl. XXVIII, Fig. 1*j*).

The mouth opening is large, pentagonal, and slightly nearer the anterior margin. It is surrounded by five prominent lobes, that project over the oral opening. Between the lobes the ambulacra are contracted and beyond the same expand to form wide phylloidal areas. The peculiar, somewhat star-shaped, form thus produced has been termed *floscelle* by Desor (Pl. XXVIII, Fig. 1*b*).

The anal opening is small, circular, and supra-marginal, and is situated in a short, narrow sulcus (Pl. XXVIII, Figs. 1*a*–1*d*).

Related forms.—*Cassidulus florealis* is allied to *C. æquoreus*, though the latter is more depressed and more elongated. *C. subconicus* presents some points of similarity, but has a more sharply defined pentagonal outline, a differently situated anal opening, and more elongated pores in the outer rows of the petaloidal areas.

Locality and geological horizon.—This species is reported from the lower marl bed (upper Cretaceous) of New Jersey and Delaware.

Collection.—Philadelphia Academy of Natural Sciences.

CASSIDULUS ÆQUOREUS Morton.

Plate XXIX, Figs. 1*a*–*i*.

Cassidulus æquoreus Morton, 1834. Synop. Organ. Remains, Cretaceous, p. 76, Pl. 3, Fig. 14.

Cassidulus æquoreus Desmoulins, 1837. Études sur les Échinides, p. 146.

Cassidulus æquoreus Agassiz and Desor, 1847. Cat. rais., p. 141.

Cassidulus æquoreus d'Orbigny, 1847. Prodrome, vol. 2, p. 271.

Cassidulus æquoreus Bronn, 1848. Index Pal., vol. 1, p. 244.

Cassidulus æquoreus d'Orbigny, 1853–'60. Paléont. française, vol. 6, p. 329, Pl. 926, Fig. 6–12.

Cassidulus æquoreus Desor, 1858. Synop. des Échinides fossiles, p. 290.

Cassidulus æquorum Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 18.

Cassidulus æquoreus Meek, 1864. Smith Misc. Coll., vol. 7 (177), p. 2.

Cassidulus æquorcus Conrad, 1868. Geol. of New Jersey, App., p. 722.

Cassidulus æquoreus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subpentagonal, depressed; upper surface convex; under surface concave, slightly rostrated posteriorly; apex forward of the center. Ambulacra narrow; poriferous zones petaloidal on the upper surface; contracted above the margin and expanded again on the lower surface, much narrowed at the peristome. Interambulacra wide, covered with small perforated tubercles. Apical disk small, situated forward of the center. Mouth opening small, with floscelle. Anal opening supramarginal, in short sulcus.

Dimensions.—Length, 1¼ inches; width, 1⅛ inches; height, ⅝ inch.

Description.—This typical Cassidulus, early recognized as such by Dr. Morton, has a depressed test, subpentagonal in outline. It is longer in the antero-posterior diameter than the lateral. The upper surface is convex, with sharp marginal edges, while the lower surface is flat, with a slight concavity toward the center. The apex is somewhat anterior to the center.

The ambulacral areas are narrow. The poriferous zones are unigeminal, the pores of the upper part of the dorsal surface arranged in petaloidal form. At a point varying in the different areas from one-quarter to one-third of the distance from the margin to the apical disk, the zones are contracted and continue as narrow bands over the margin and to the vicinity of the peristome, where they broaden again perceptibly, becoming finally much contracted at the margin of the oral opening (Pl. XXIX, Fig. 1*e*). The pores are distinct in the petaloidal portion (Pl. XXIX, Fig. 1*f*) and in the broadened area near the peristome (Pl. XXIX, Fig. 1*g*), but in the intermediate contracted portion are small and indistinct. The interambulacral areas are broad, and covered by small perforated tubercles with sunken areolas.

The apical disk is composed of four perforated genital and five small ocular plates. As explained under the previous species, the fifth genital is obsolete (Pl. XXIX, Fig. 1*h*).

The mouth opening is pentagonal and surrounded by a well-developed floscelle. The oral lobes are very prominent and the ambulacral furrows much contracted (Pl. XXIX, Fig. 1*i*).

The anal opening is situated in a short sulcus on the upper surface (Pl. XXIX, Figs. 1*a*–1*d*).

Related forms.—This species is separated from the preceding, with which it has much in common, by its more depressed and elongated form. From *C. micrococcus* it is separated by its sharper apex, more angular margin, the position of the anal opening, and the shorter pore openings in the outer rows.

Locality and geological horizon.—This species is reported from the Ripley group (upper Cretaceous) of Alabama. No more definite statement as to the locality is given.

Collection.—Philadelphia Academy of Natural Sciences.

CASSIDULUS MICROCOCCUS Gabb.

Plate XXX, Figs. 1*a*–*i*.

Cassidulus micrococcus Gabb, 1860. Philadelphia Acad. Nat. Sci. Proc., p. 519.
Cassidulus micrococcus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test oval, rounded anteriorly, slightly rostrated posteriorly; upper surface convex, flattened at the apex; sides equally declining. Ambulacra moderately broad; poriferous cones petaloidal on dorsal surface; outer row of pores slit-like in petaloidal portion. Mouth opening small, pentagonal, with floscelle. Anal opening oval, situated high on upper surface, in long, narrow sulcus.

Dimensions.—Length, 1¾ inches; width, 1½ inches; height, ¾ inch.

Description.—This species has a distinctly oval form, wider posteriorly. The upper surface is elevated at the margin, but somewhat flattened at the apex. The sides decline very nearly equally. The base is flattened, with a slight concavity at the mouth edges. The posterior margin is truncated and slightly rostrated.

The ambulacral areas are rather broad, contracted about one-quarter of the distance from the ambitus to the apex, and narrowed nearly to the peristome, where they are again broadened to form indistinct phylloidal areas (Pl. XXX, Figs. 1*f*, 1*g*). The pores are slit-like in the outer rows of the petaloidal portion (Pl. XXX, Fig. 1*f*).

The interambulacral plates are covered with minute tubercles, with sunken areolas, that increase in size and number on the base (Pl. XXX, Fig. 1*i*).

The apical disk is situated slightly in front of the center of the upper surface. The right anterior genital plate, which is modified to form the madreporite, is very large. The posterior genital is not developed, or if present the suture is obscured (Pl. XXX, Fig. 1*h*).

The anal opening is oval, situated high upon the upper surface, in a long, narrow, and deep sulcus (Pl. XXX, Figs. 1*a*, 1*d*).

Related forms.—A comparison of this species with *Cassidulus æquo-*

reus, as made also by Gabb in his original description, shows that the present form is much larger and more oval, and that the anal opening is situated higher and in a deeper and longer sulcus, and, furthermore, that the pores of the outer row in the petaloidal portion are elongated and slit-like.

Locality and geological horizon.—This species is from the Ripley group (upper Cretaceous) of Eufaula, Alabama.

Collection.—Philadelphia Academy of Natural Sciences.

CASSIDULUS SUBQUADRATUS Conrad.

Plate XXXI, Figs. 1 *a–h*.

Cassidulus subquadratus Conrad, 1860. Philadelphia Acad. Nat. Sci. Jour., 2d ser., vol. 4, p. 291, Pl. 47, Fig. 19.

Cassidulus subquadratus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subquadrate to subpentagonal, hemispherical; sides equally declining, upper surface convex; lower surface concave; posterior margin truncated and rostrated. Poriferous zones broadly petaloidal on upper two-thirds of the dorsal surface; sharply contracted at lower margin of petaloidal areas. Mouth opening small, pentagonal, with well-defined floscelle. Apical disk large, slightly anterior to the center. Anal opening round, in deep sulcus.

Dimensions.—Length, 2¼ inches; width, 2 inches; height, 1 inch.

Description.—This remarkably symmetrical *Cassidulus* has a nearly hemispherical form. In outline it is nearer subpentagonal than subquadrate, due to the rostrated character of the posterior margin, which is at the same time truncated. The anterior margin is rounded. The lateral edges are nearly parallel, though somewhat more approximated anteriorly. The apex is slightly forward of the center.

The ambulacral areas are moderately wide in the petaloidal portion, narrow beyond. The poriferous zones are composed in the petaloidal portion of an inner row of small, nearly circular pores and of an outer row of oblique slit-like openings. The pores of each pair are united by a shallow furrow (Pl. XXXI, Fig. 1*f*). Beyond the petaloidal areas the narrow plates of those portions give place to broad plates, each with a pair of small, round pores in the lower and outer corner (Pl. XXXI, Fig. 1*c*). In the vicinity of the peristome the poriferous zones expand and the pores increase in size, though apparently reduced in number (Pl. XXXI, Fig. 1*g*). The last pair of plates are much contracted.

The interambulacral areas are wide. The plates are covered with minute tubercles with depressed areolas, which become larger and more prominent on the lower surface.

The apical disk is large, composed of four perforated genital and five ocular plates. The fifth genital is apparently obsolete (Pl. XXXI, Fig. 1*h*).

The mouth opening is small, pentagonal, and surrounded by a well-developed floscelle. The anal opening is round and situated high above the margin, in a deep sulcus, that becomes narrower and shallower toward the ambitus.

Related forms.—This species is most closely related to *Cassidulus subconicus*, but the latter is much more elevated, while the anal opening is situated higher and in a less depressed sulcus than in *C. subquadratus*.

Locality and geological horizon.—This form is from the Ripley formation (upper Cretaceous) of Mississippi. The specimen described is from Holly Springs, and was collected by Mr. W. J. McGee.

Collection.—U. S. National Museum.

CASSIDULUS SUBCONICUS Clark.

Plate XXXII, Figs. 1*a*–*k*.

Cassidulus subconicus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test subconical; margin subpentagonal, truncated and rostrated posteriorly; apex anteriorly placed. Ambulacra broad in petaloidal portion, narrow beyond; poriferous zones unigeminal, pores with slit-like openings in outer row of petaloidal areas. Apical disk large, anteriorly situated. Mouth opening subcircular, with very prominent floscelle. Anal opening large, situated high on upper surface in shallow sulcus.

Dimensions.—Length, 1⅞ inches; width, 1¾ inches; height, 1⅛ inches.

Description.—The outline of this form is so similar to the one preceding that there was some hesitation, at first, in establishing it as an independent species. More careful examination of numerous specimens of each species has proved the constant occurrence of the individual differences. *Cassidulus subconicus* is, as its name signifies, subconical. In marginal outline it is subpentagonal, the posterior border more or less rostrated and clearly truncated. The apex is slightly forward of the center, giving a somewhat sharper slope to the anterior portion of the test than to the posterior.

The ambulacral areas are broad in the petaloidal portion, beyond which they are narrowed. At the margin they again acquire considerable width, but gradually contract beyond, although expanded for a short distance in the phylloidal area near the mouth opening (Pl. XXXII, Fig. 1*e*). At the peristome the final pair of plates is highly attenuated (Pl. XXXII, Fig. 1*g*). The pores of the outer rows, in both the petaloidal and phylloidal areas, are in a marked degree elongated. In the intermediate portion of the column they are small and indistinct.

The interambulacral areas are more prominent than the ambulacral, which are slightly depressed. The surface is covered with minute tubercles and a microscopic granulation (Pl. XXXII, Fig. 1*i*).

The apical disk is large, and composed of four perforated genital plates and five ocular plates. The fifth genital is apparently obsolete (Pl. XXXII, Fig. 1*k*).

The mouth opening is large, subcircular, and surrounded by a very prominent floscelle (Pl. XXXII, Fig. 1*h*). The anal opening is large, circular, and is situated high above the margin in a shallow sulcus.

Related forms.—Cassidulus subconicus is closely related to *C. subquadratus*, but is separated from it by its high subconical test, more elevated anal opening, and shallow anal sulcus.

Locality and geological horizon.—Like the preceding species, *Cassidulus subconicus* is from the Ripley group (upper Cretaceous) of Mississippi.

Collection.—U. S. National Museum.

CASSIDULUS PORRECTUS Clark.

Plate XXXIII, Figs. 1*a–b*; Plate XXXIV, Figs. 1*a–b*; Plate XXXV, Figs. 1*a–d*.

Cassidulus porrectus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test very large, subcircular, oval, depressed; upper surface convex; lower surface concave; broader posteriorly than anteriorly; apex forward of the center. Ambulacra broad. Interambulacra thickly covered with minute tubercles. Apical disk small, forward of the center. Mouth opening large, subconical, with prominent floscelle. Anal opening supra-marginal, in short shallow sulcus.

Dimensions.—Length, 4 inches; width, 4 inches; height, 2 inches.

Description.—This very large Cassidulus, with one exception the largest Echinoid in the American Mesozoic, has an irregularly oval, depressed test, that is subcircular in marginal outline. The breadth is equal to the length, but is greatest in the posterior portion, so that the margin appears contracted anteriorly. The apex is some distance forward of the center and slightly flattened. The posterior margin is feebly truncated.

The ambulacral areas are wide; the contractions below the petaloidal region and above the phylloidal continue for short distances, while the lowest pair of plates in the column bordering the mouth opening are long and greatly attenuated (Pl. XXXV, Fig. 1*a*). The pores of the outer rows are slit-like in form and obliquely placed (Pl. XXXV, Figs. 1*b*, 1*c*).

The interambulacral areas are prominent; the plates are covered with numerous small tubercles, with depressed areolas, which are larger and more prominent on the under than the upper surface (Pl. XXXIII. Fig. 1*d*). The apical disk is small and is placed forward of the center.

The mouth opening is large, subcircular, with very prominent floscelle. The oral lobes project far beyond the level of the base and are separated by deep ambulacral furrows (Pl. XXXIV, Fig. 1*a*).

The anal opening is large, oval, and is situated at the head of a short, narrow sulcus (Pl. XXXIII, Figs. 1*a*, 1*b*).

Related forms.—Cassidulus porrectus is from its size, form, and details of structure readily separated from the other species of Cassidulus described from the American and European Mesozoic.

Locality and geological horizon.—Cassidulus porrectus is from the Ripley group (upper Cretaceous), of Eufaula, Alabama. In the preliminary report, published in the Johns Hopkins Circulars, the writer incorrectly cites Mississippi as the locality.

Collection.—U. S. National Museum.

CASSIDULUS STANTONI Clark.

Plate XXXV, Figs. 2*a–d*.

Cassidulus Stantoni Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 76.

Determinative characters.—Test small, subovate, elevated; upper surface convex, lower surface concave; apex forward of the center. Ambulacra very narrow. Apical disk small, forward of the center. Mouth opening small, with floscelle. Anal opening high above margin, in long, narrow, and deep sulcus.

Dimensions.—Length, ⅝ inch; width, ½ inch; height, ¼ inch.

Description.—This minute Cassidulus has a subovate test, an elevated, convex upper surface and a concave lower surface. It is broader posteriorly than anteriorly, and the posterior margin is truncated. The apex is situated slightly anterior to the center of the upper surface (Pl. XXXV, Fig. 2*a*).

The ambulacral areas are very narrow. The petaloidal portion but slightly exceeds the remainder in width, which is nearly equal throughout. The phylloidal region is feebly outlined.

The interambulacral areas are broad, but the poor state of preservation of the specimens renders it impossible to determine all the details of structure.

The apical disk is small and forward of the center, but not sufficiently well preserved to distinguish the individual plates. The mouth opening is small and surrounded by a feeble floscelle. The anal opening is round and situated high above the margin, at the head of a narrow, deep sulcus (Pl. XXXV, Figs. 2*a*, 2*d*).

Related forms.—Cassidulus Stantoni is quite unlike any other representative of this genus from American strata, and can not be readily associated with any European species.

Locality and geological horizon.—This species is from the Colorado group (upper Cretaceous) of Muddy creek, Huerfano county, Colorado.

Collection.—U. S. National Museum.

HOLASTERIDÆ.

Test ovate or cordate. Ambulacra narrow; poriferous zones narrow, pores unigeminal. Apical disk elongated, at times so much that the three anterior ambulacra are widely separated from the two posterior. Mouth opening excentric, anteriorly situated. Anal opening inframarginal or marginal.

ANANCHYTES Mercati.

ANANCHYTES OVALIS Clark.

Plate XXXVI, Fig. 1*a–h*.

Determinative characters.—Test subovate cordate; contracted posteriorly; upper surface convex; lower surface flat. Apical disk elongated, consisting of four perforated genital and five ocular plates situated slightly forward of the center. Mouth opening near the anterior margin. Anal opening oval, situated on a slight protuberance of the posterior margin.

Dimensions.—Length, 1¾ inches; width, 1½ inches; height, 1¼ inches.

Description.—The two specimens of this species collected by the writer are remarkably well preserved and admit of the determination of all the essential features. The test is in lateral outline subovate, though somewhat cordate in form when viewed from above or below. A marked protuberance (Pl. XXXVI, Fig. 1*c*) is present on the posterior margin that appears as a slight ridge on the lower surface between the mouth and anal openings. The upper surface is convex. The sides are full and rounded at the ambitus. The base is nearly flat, with the exception of the slight ridge and depressed mouth edges.

The ambulacral areas are wide and straight, attaining their greatest width just above the ambitus. The pores are oval, and those of each pair are placed at an angle to one another (Pl. XXXVI, Fig. 1*g*). The surface of both the ambulacral and interambulacral plates is covered by small tubercles, between which are numerous microscopic granules. The apical disk is elongated (Pl. XXXVI, Fig. 1*f*). The four genital plates are large and distinctly perforated. The anterior, right-hand genital plate, which serves as the madreporite, is much larger than any of the others, being several times the size of the anterior left-hand genital, with which it is in contact. The posterior genitals are very nearly of equal size.

The mouth opening is transversely oblong and situated near the anterior margin. The anal opening is oval and situated on a marked protuberance on the posterior margin.

Related forms.—The present species is the only representative of the genus recognized from American deposits. It is more ovate and less elevated than the forms described from European strata.

Locality and geological horizon.—This species is from the yellow limestone of the middle marl bed (upper Cretaceous) of Vincentown, New Jersey.

Collection.—Johns Hopkins University.

CARDIASTER Forbes.

CARDIASTER CINCTUS Morton.

Plate XXXVII, Figs. 1*a–h*.

Spatangus sp. Morton, 1829. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 122.
Ananchytes sp. Morton, 1830. Am. Jour. Sci., 1st ser., vol. 17, p. 287.
Ananchytes cinctus Morton, 1830. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 200.
Ananchytes fimbriatus Morton, 1830. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 200.
Ananchytes cinctus Morton, 1830. Am. Jour. Sci., 1st ser., vol. 18, p. 246, Pl. 3, Fig. 7.
Ananchytes fimbriatus Morton, 1830. Am. Jour. Sci., 1st ser., vol. 18, p. 245, Pl. 3, Fig. 9.
Ananchytes cinctus Morton, 1834. Synop. Organ. Remains, Cretaceous, p. 78, Pl. 3, Fig. 19.
Ananchytes fimbriatus Morton, 1834. Synop. Organ. Remains, Cretaceous, pp. 77, 79, Pl. 3, Fig. 20.
Holaster cinctus Agassiz and Desor, 1840. Cat. Syst., p. 1.
Holaster cinctus Agassiz and Desor, 1847. Cat. rais., p. 133.
Holaster fimbriatus Agassiz, 1847. Cat. rais., p. 141.
Holaster cinctus d'Orbigny, 1847. Prodrome, vol. 2, p. 269.
Holaster fimbriatus d'Orbigny, 1847. Prodrome, vol. 2, p. 269.
Holaster cinctus Bronn, 1848. Index Pal., vol. 1, p. 593.
Ananchytes fimbriatus Bronn, 1848. Index Pal., vol. 1, p. 70.
Cardiaster cinctus d'Orbigny, 1853–'60. Paléont. française, vol. 6, p. 147; Pl. 905, Fig. 4.
Cardiaster fimbriatus d'Orbigny, 1853–'60. Paléont. française, vol. 6, p. 147; Pl. 905, Fig. 3.
Cardiaster cinctus (*Cardiaster fimbriatus*) Desor, 1858. Synop. des Échinides fossiles, p. 346.
Ananchytes cinctus Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 18.
Ananchytes fimbriatus Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 18.
Holaster cinctus Credner, 1870. Zeitschr. d. deutsch. geol. Gesells. XXII, p. 218.
Holaster cinctus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test cordate, distinctly grooved anteriorly; contracted posteriorly; upper surface convex; lower surface flat. Ambulacra wide. Apical disk much elongated, consisting of four perforated genital and five ocular plates situated slightly forward of the center. Mouth opening near the anterior margin. Anal opening oval, situated on the truncated posterior margin.

Dimensions.—Length, 2 inches; width, 2 inches; height, 1½ inches.

Description.—This species, which is among the earliest of the Echinoid forms recognized from American Cretaceous strata, is distinctly cordiform, with a pronounced groove on the anterior face that is occupied by the unpaired ambulacrum. Opposite thereto is a slight ridge at the central suture of the unpaired posterior interambulacrum that is suddenly terminated by the nearly vertically truncated surface of the posterior margin. The sides decline equally to the ambitus, giving an oval outline to the vertical lateral section. The lower surface is nearly flat, with the exception of the slight depressions directly at the mouth edges and the elevated area extending from the center of the base to the posterior margin.

The ambulacral areas are wide, apetaloid, and separated at the apex. The antero-lateral pair are bent backward in their upper part, beyond which they extend straight to the margin. The postero-lateral pair are bent somewhat forward, after which they extend straight over the margin. The single ambulacrum is situated in the deep anterior sulcus. The pores of the paired ambulacra consist, in the upper portion of the columns, of oblique oval openings united by furrows (Pl. XXXVII, Fig. 1*f*), while lower down they become small and often indistinct (Pl. XXXVII, Fig. 1*f*). In the unpaired ambulacrum the pores are extremely small.

The surface of the interambulacral as well as of the ambulacral plates is covered with fine granules, among which are irregularly scattered numerous small perforated tubercles.

The apical disk is narrow, elongated. The four perforated genital plates are disposed in pairs, between which two of the five ocular plates are situated. Forming the posterior portion of the disk are two more ocular plates, while the fifth plate comprises the anterior part. The ambulacral areas are on this account separated at their apices (Pl. XXXVII, Fig. 1*h*).

The mouth opening is transversely oblong and is situated near the anterior margin of the base. The anal opening is oval and situated on the truncated surface at the posterior margin of the test (Pl. XXXVII, Fig. 1*e*).

Related forms.—This species is separated from *Holaster simplex*, the only other closely related form found in American Mesozoic deposits, by its deep anterior sulcus and less inflated upper surface.

Locality and geological horizon.—*Cardiaster cinctus* is from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collections.—Philadelphia Academy of Natural Sciences; American Museum of Natural History, New York.

HOLASTER Agassiz.

HOLASTER SIMPLEX Shumard.

Plates XXXVIII, Figs. 1*a–g*; XXXIX, Figs. 1*a–d*.

Holaster simplex Shumard, 1853. Rept. Expl. Red River of Louisiana in 1852, p. 210, Pl. 3. Fig. 2.
Holaster comanchesi Marcou, 1858. Geol. of North America, p. 40, Pl. 3, Fig. 3.
Holaster simplex Desor, 1858. Synop. des Échinides fossiles, p. 450.
Holaster comanchesi Desor, 1858. Synop. des Échinides fossiles, p. 449.

Holaster simplex Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Holaster comanchesi Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Holaster simplex Meek, 1864. Smith. Misc. Coll., vol. 7, (177), p. 3.
Holaster comanchesi Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 3.
Holaster simplex Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test oblong, cordiform; upper surface much elevated, rounded, and grooved on the anterior face; lower surface flat; apex nearly central. Ambulacra wide; pores unigeminal, with slit-like openings in upper portion of the column that become indistinct toward the margin and upon the base. Apical disk compact and not greatly elongated. Mouth opening transversely oval, situated near the anterior margin. Anal opening large, on truncated posterior margin.

Dimensions.—Length, 2¾ inches; width, 2¼ inches; height, 2 inches.

Description.—After the most careful examination of a large number of specimens the writer has been unable to find any constant characters that would warrant the separation of the forms described as *Holaster simplex* and *Holaster comanchesi.* They are accordingly included under the same species. The test is oblong, cordiform, much elevated, rounded above and flattened below. A shallow groove occupies the anterior face of the test, producing a feeble emargination of the anterior ambitus. A slight ridge extends along the line of the central suture of the single interambulacrum, which is suddenly terminated by the truncated face of the posterior margin.

The ambulacral areas are wide. The poriferous zones of the paired ambulacra are in the case of the posterior pair bent more or less forward in their upper portions, and in the case of the anterior slightly backward. The pores of the paired ambulacra have elongated openings in the upper portion (Pl. XXXVIII, Fig. 1*d*) and become very small and indistinct below (Pl. XXXVIII, Fig. 1*e*). The pores of the unpaired ambulacrum are exceedingly small.

The surface of both interambulacral and ambulacral plates are covered by small tubercles, between which are numerous microscopic granules (Pl. XXXIX, Figs. 1*c*, 1*d*).

The apical disk is compact and rather short. The four genital plates are large and broad. The two interposed oculars are large; the remaining three very small (Pl. XXXVIII, Fig. 1*f*).

The mouth opening is large, transversely oblong, and situated near the anterior margin (Pl. XXXVIII, Fig. 1*b*). The anal opening is oval, acuminate above, and situated on the truncated posterior border (Pl. XXXIX, Fig. 1*b*).

Related forms.—*Holaster simplex* is separated from *Cardiaster cinctus* by its more elevated upper surface and shallow anterior sulcus. It is very like *Holaster lævis*, var. *planus*, from the European Cretaceous, but is more elevated and distinctly broader posteriorly.

Locality and geological horizon.—This species is from the Washita formation of the Comanche series (lower Cretaceous) of Texas. It is found in Bell and Bexar counties, and near Fort Worth; also at Preston, Grayson county, on the Red river and at Austin. It is also found near Fort Washita, Indian Territory.

Collection.—U. S. National Museum.

SPATANGIDÆ.

Test bilaterally symmetrical, generally cordiform. Ambulacra unequal and petaloidal. Apical disk compact. Mouth opening transversely bilabiate or pentagonal, situated anteriorly. Anal opening posteriorly situated and supra-marginal. Spines of different sizes.

ENALLASTER D'Orbigny.

ENALLASTER TEXANUS (Roemer).

Plate XXXIX, Figs. 2*a–g*.

Toxaster texanus Roemer, 1849. Texas, etc., p. 393.
Toxaster texanus Roemer, 1852. Die Kreidebildungen von Texas, p. 85, Pl. 10, Fig. 3.
Toxaster ungula Giebel, 1853. Jahresber. des naturw. Vereins in Halle, p. 373.
Enallaster texasus d'Orbigny, 1853–'60. Paléont. française, vol. 6, p. 184, Pl. 850, Fig. 1–7.
Toxaster texanus Conrad, 1857. U. S. and Mex. Bound. Surv. Rept., vol. 1, pt. 2, p. 145, Pl. 1, Fig. 2*a*–2*c*.
Enallaster texanus Desor, 1858. Synop. des Échinides fossiles, p. 358.
Toxaster texanus Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Toxaster texanus Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 3.
Enallaster texanus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test oblong, cordiform, broad in anterior portion, contracted and truncated posteriorly, with deep anterior groove; upper surface convex, elevated; base flat, depressed at the mouth opening; sides rounded; apex excentric and posterior. Ambulacra narrow and unequal, the postero-lateral pair much shorter than the others. Apical disk small and compact. Anal opening situated high above the margin.

Dimensions.—Length, 1⅜ inches; width, 1¼ inches; height, ⅞ inch.

Description.—The exact limitations of this species have in most of the earlier publications been very imperfectly designated. Other forms, even one of a different genus, have been included. The test is oblong, cordiform, and elevated. The upper surface is convex, with a well-defined anterior groove, narrow and slightly depressed at its head. On the posterior face the surface is truncated to the margin. The sides are rounded and inflated. The base is flat, except for the peristomial depression near the anterior margin and the central elevated region extending from the same to the posterior border.

The ambulacral areas are narrow and very unequal. The antero-lateral pair are large and curved backwards in their upper portions. The pores are very unequal; those of the anterior zone are small and near together, those of the posterior elongated, the external nearly wice as large as the internal series (Pl. xxxix, Fig. 2*e*). There are bout 35 pairs of pores in the petaloidal portion of each poriferous one.

The postero-lateral pairs are short and quite symmetrical in structure. here are 16 pairs of pores in the petaloidal portions of each poriferous one.

The anterior unpaired ambulacrum is situated in the anterior groove, d is wider than the other areas. An elongated pore appears in the xternal rows on alternate plates. On the intervening plates the nall rows are closely approximated (Pl. xxxix, Fig. 2*f*). In the lower rtion of each column the plates are large and oblong. A pair of minute res occupy the lower outer corner of each.

The surface of the test is covered with a minute granulation, scat- red among which are numerous small tubercles.

The apical disk is small and compact, and the four large genital tes are distinctly perforated. The right antero-lateral plate occupies e center of the body. The five small oculars are wedged in between e genitals (Pl. xxxix, Fig. 2*g*).

The mouth opening is transversely oblong and situated in a depres- n.

The anal opening is situated high upon the truncated posterior rgin, and is small and oval, acuminate below (Pl. xxxix, Fig. 2*d*).

Related forms.—It seems not improbable that *Spatangus columbianum*, scribed by Lea in 1840, from the United States of Colombia, may ove to be identical, or at least very closely related to the Texan m. The indistinct figure shows a different arrangement of the pores the antero-lateral ambulacra, but it is doubtful whether it can be de- ded upon for such details of structure. It seems unwise, however, eplace the term *texanus* when any doubt upon this point still remains. *nallaster peruvianus*, described by Gabb in 1876, from material ob- ned from Peru, seems to be identical.

mong the European Enallasters none apparently are closely related *Enallaster texanus*.

ocality and geological horizon.—*Enallaster texanus* is found widely Texas in the Fredericksburg formation of the Comanche series wer Cretaceous). It is characteristic of the Comanche peak horizon.

ollections.—U. S. National Museum; Texas Geological Survey; Bos- Society of Natural History; Prof. Robt. T. Hill.

ENALLASTER OBLIQUATUS Clark.

Plate xl, Figs. 1*a*–*l*.

eterminative characters.—Test oval, cordiform; upper surface con- , flattened and depressed anteriorly, elevated posteriorly; lower ace flat, with peristomial depression; apex forward of the center. bulacra narrow, unequal. Surface of the plates covered with small tubercles and intervening microscopic granulation. Apical disk compact. Mouth opening transversely subpentagonal. Anal opening situated on truncated posterior margin.

Description.—This species has a broad cordiform test, that is flattened and slanting on the anterior upper surface, whence the name *obliquatus*. The anterior groove is deep, wider at its head, and cuts broadly into the anterior margin. The posterior portion of the test is elevated near the apex and obliquely truncated toward the margin. The sides are sloping anteriorly, fuller posteriorly. The base is flat with a deep peristomial depression.

The ambulacral areas are narrow and unequal. The antero-lateral pair are slightly depressed and curved backwards in the upper portion. The pores are unequal, those of the anterior zone small and near together, those of the posterior elongated, the exterior much more so than the anterior series (Pl. XL, Fig. 1*f*). There are about forty pairs of pores in each zone.

The postero-lateral pair are short and slightly depressed. The pores are more nearly equal and about twenty-four pairs are found in each zone. The single ambulacrum is placed in the anterior groove and is much wider than the paired ambulacra. The pores of the different plates vary in size and position (Pl. XL, Fig. 1*e*). The plates in the lower portions of the areas are large and oblong in form.

The surface of the test is covered with minute tubercles between which is a microscopic granulation. The apical disk is small and compact (Pl. XL, Fig. 1*i*).

The mouth opening is transversely subpentagonal (Pl. XL, Fig. 1*h*). The anal opening is oval and situated high on the truncated posterior margin (Pl. XL, Fig. 1*d*).

Related forms.—*Enallaster obliquatus* is separated from *E. texanus*, the only other representative of this genus from the Cretaceous deposits of the United States, by its broader more depressed form, more sunken anterior sulcus, and the lower position of the anal opening. It is closely related to *E. mexicanus*, described by Cotteau, in 1890, from material obtained from Mexico.

Locality and geological horizon.—This species is from the Fredericksburg formation of the Comanche series (lower Cretaceous) of Texas. It is characteristic of the alternating or Glen Rose beds of Austin and Glen Rose.

Collections.—U. S. National Museum; Texas Geological Survey.

EPIASTER D'Orbigny.

EPIASTER ELEGANS (Shumard).

Plate XLI, Figs. 1*a–b;* Plate XLII, Figs. 1*a–b;* Plate XLIII, Figs. 1*a–e*.

Hemiaster elegans Shumard, 1853. Rept. Expl. Red River of Louisiana in 1852, p. 210, Pl. 2, Figs. 4a–4c.

Toxaster elegans Gabb, 1859. Cat. Invert. Fossils Cretaceous, p. 19.

Toxaster elegans Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 3.
Macraster texanus Roemer, 1888. Neues Jahrbuch für Min., Geol., u. Pal., Bd. I, pp. 191–195, Pl. 6, Figs. 1–4.
Epiaster elegans Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test large, oblong, cordiform, flattened both above and below; sides rounded, with a shallow anterior groove and truncated posterior margin. Ambulacra subpetaloidal, depressed; poriferous zones straight, pores with elongated, slit-like openings. Apical disk small, compact. Mouth opening transversely oval, situated near the anterior margin. Anal opening oval, situated on the truncated posterior margin.

Dimensions.—Length, 4 inches; width, 3¾ inches; height, 2 inches.

Description.—Roemer in 1888 established a new genus and species (*Macraster texanus*) for a form that is identical with *Hemiaster elegans* described by Shumard in 1853. The species properly belongs to the genus *Epiaster*. There does not seem to be a sufficiently wide difference between the characters assigned to *Macraster* and those properly belonging to *Epiaster* to warrant the acceptance of the former genus for the present species.

The test is very large and flattened on both the upper and lower surfaces. The sides are round. The groove on the anterior face is shallow and cuts the margin lightly. The posterior face is obliquely but not broadly truncated.

The ambulacral areas are nearly equal, depressed, with a distinct furrow on the upper surface (Pl. XLI, Fig. 1*a*). The poriferous zones are long, wide, and straight, and the pores consist of slit-like openings (Pl. XLIII, Figs. 1*b*, 1*c*). The zones are subpetaloidal on the upper surface, reaching quite to the upper margin of the rounded sides. The unpaired ambulacrum is narrower than the others; the pores are smaller and more closely approximated.

The surface of both areas is covered with minute tubercles, between which are microscopic granules (Pl. XLIII, Fig. 1*d*).

The apical disk is small, compact, and consists of four large perforated genital plates and five small oculars (Pl. XLIII, Fig. 1*e*).

The mouth opening is transversely oval and situated near the anterior margin (Pl. XLII, Fig. 1*a*).

The anal opening is large, oval, and situated on the truncated face of the posterior margin (Pl. XLII, Fig. 1*b*).

Related forms.—*Epiaster elegans* is most nearly related to *E. Whitei*, the single other American representative of this genus, but is separated from it by its great size, its excessively long subpetaloidal areas, and the position of the anal opening, which is on an obliquely truncated surface that opens downward, while on *E. Whitei* it is situated on a vertical face that opens upwards.

Locality and geological horizon.—*Epiaster elegans* is from the Washita formation of the Comanche series (lower Cretaceous) of Texas. It is characteristic of the Fort Worth limestone, and is found at numerous localities between Denison and El Paso.

Collections.—U. S. National Museum; Johns Hopkins University; Boston Society of Natural History; Texas Geological Survey; Prof. Robt. T. Hill.

EPIASTER WHITEI Clark.

Plate XLIII, Figs. 2*a–d*; Plate XLIV, Figs. 1*a–g*.

Toxaster elegans Conrad, 1857. U. S. and Mex. Bound. Surv. Rept., vol. 1, pt. 2, p. 146, Pl. 21, Fig. 1*a–e*.[1]

Epiaster Whitei Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test small, cordiform; upper surface convex, elevated; lower surface flat; sides inflated; apex forward of the center. Ambulacra moderately broad; poriferous zones petaloidal, pores with elongated openings; antero-lateral pair bent slightly backward in upper part. Apical disk oval. Mouth opening transversely oval. Anal opening small, oval, situated high on posterior border.

Dimensions.—Length, 1½ inches; width, 1⅜ inches; height, ¾ inch.

Description.—This species has been frequently confounded with *Enallaster texanus* and *Epiaster elegans.* With the former it has little in common beyond a certain similarity in outward form, while the points of difference from the latter are less striking and will be shortly stated.

The test is small and cordiform. The upper surface is distinctly elevated, the apex occupying a point anterior to the center. The lower surface is flat with the exception of the peristomial depression. The sides are inflated with a well marked groove at the center of the anterior face and a prominent truncated surface on the posterior margin.

The ambulacral areas are moderately broad. The poriferous zones are subpetaloidal in their upper part, but this feature does not continue to the margin (Pl. XLIII, Fig. 2*c*). The pores in the paired ambulacra are all of about equal size and equally spaced. In the unpaired ambulacrum they are smaller and nearer together. The antero-lateral pair are bent slightly backward in their upper part. They are distinctly larger than the postero-laterals.

The interambulacral areas are prominent and the surface of the plates covered with minute tubercles and microscopic granules (Pl. XLIV, Fig. 1*c*).

The apical disk is small, compact, and consists of four large perforated genital plates and five oculars.

The mouth opening is transversely subpentagonal and situated near the anterior margin (Pl. XLIV, Figs. 1*b*, 1*f*).

The anal opening is small, oval, and situated high on the truncated posterior margin (Pl. XLIII, Fig. 2*b*).

Related forms.—In many particulars *Epiaster Whitei* is to be closely associated with *E. elegans.* It is, however, more elevated, the ambulacral furrows are shorter, and the anal opening is differently situated, as previously mentioned in the description of the latter species.

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[1] Figured under the name of *Holaster elegans.*

Locality and geological horizon.—*Epiaster Whitei* is from the Washita formation of the Comanche series (lower Cretaceous) of Texas. It is found in the Duck creek chalk of Denison, associated with *Hamites Fremontii* Marcou.

Collection.—U. S. National Museum.

HEMIASTER PARASTATUS (Morton).

Plate XLV, Figs. 1*a–m*.

Spatangus sp. Morton, 1830. Am. Jour. Sci., 1st ser., vol. 17, p. 286.

Spatangus cor-marinum (?) Morton, 1830. Am. Jour. Sci., 1st ser., vol. 18, p. 250, Pl. 3, Fig. 10.

Spatangus cor-marinum (?) Morton, 1830. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 199.

Spatangus parastatus Morton, 1833. Am. Jour. Sci., 1st ser., vol. 23, p. 294.

Spatangus parastatus Morton, 1834. Synopsis Organ. Remains, Cretaceous, p. 77, Pl. 3, Fig. 21.

Hemiaster parastatus Agassiz and Desor, 1847. Cat. rais., p. 141.

Hemiaster parastatus d'Orbigny, 1847. Prodrome, vol. 2, p. 270.

Spatangus parastatus Bronn, 1848. Index Pal. vol. 1, p. 1160.

Hemiaster parastatus d'Orbigny, 1853–'56, Paléont. française, vol. 6, p. 265, Pl. 894, Fig. 4.

Hemiaster parastatus Desor, 1858. Synop. des Échinides fossiles, p. 373.

Holaster parastatus Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.

Hemiaster (?) *parastatus* Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 3.

Hemiaster parastatus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test cordiform, inflated; upper surface elevated, with deep groove on anterior surface and sharp ridge posteriorly that is terminated by the flat, nearly vertical, truncated face of the posterior margin. Ambulacral petals depressed, the anterior pair twice as long as the posterior. Apical disk small, compact. Mouth opening with distinct, overhanging lip. Anal opening small, situated high on truncated surface.

Dimensions.—Length, 1½ inches; width, 1½ inches; height, 1⅛ inches.

Description.—This interesting and rather common form has a high, cordiform test, with deep anterior sulcus and high posterior ridge on the upper surface, the latter terminated by the high and nearly vertically truncated face of the posterior margin. The sides are rounded and inflated. The base is flat, with the exception of the peristomial depression.

The ambulacral areas are very unlike. The poriferous zones are distinctly petaloidal (Pl. XLV, Fig. 1*e*). The petals of the postero-lateral pair are short and broad. Those of the antero-lateral pair are bent backward at their center, depressed, and about twice the length of the postero-lateral pair. The pores are slightly elongated (Pl. XLV, Fig. 1*h*). The unpaired ambulacrum is very broad, the poriferous zones far apart, and the pores small and approximated (Pl. XLV, Fig. 1*f*).

The surface is covered with small tubercles, between which are numerous microscopic granules (Pl. XLV, Figs. 1*f*, 1*g*, 1*i*, 1*l*, and 1*m*).

The apical disk is small and situated posteriorly to the center of the upper surface. The four genital plates are distinctly perforated and separated by the five small oculars (Pl. XLV, Fig. 1*n*).

The mouth opening is transversely arched and bilabiate. The lower lip projects prominently. The anal opening is small and situated high on the truncated surface of the posterior margin. The peripetalous fasciole is broad and distinct (Pl. XLV, Figs. 1*i*, 1*k*).

Related forms.—*Hemiaster parastatus* is most closely related to *H. ungula*, from which, however, it is separated by its deeper and broader anterior sulcus, more posterior position of the apical disk, and more inflated sides. It is apparently distinct from any of the many species described from European deposits.

Locality and geological horizon.—*H. parastatus* is from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey, and also from the Ripley group (upper Cretaceous) of Alabama.

Collections.—Philadelphia Academy of Natural Sciences; American Museum of Natural History, New York; Johns Hopkins University.

HEMIASTER Desor.

HEMIASTER STELLA (Morton).

Plate XLVI, Figs. 1*a*–*d*.

Spatangus stella Morton, 1830. Am. Jour. Sci., 1st ser., vol. 18, p. 245, Pl. 3, Fig. 11.
Spatangus stella Morton, 1830. Philadelphia Acad. Nat. Sci. Jour., 1st ser., vol. 6, p. 200.
Spatangus stella Morton, 1834. Synop. Organ. Remains Cretaceous, p. 78, Pl. 3, Fig. 18.
Hemiaster stella Agassiz and Desor, 1847. Cat. rais., p. 141.
Hemiaster stella Desor, 1858. Synop. des Échinides fossiles, p. 373.
Hemiaster stella Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Hemiaster (?) *stella* Meek, 1864. Smith Misc. Coll., vol. 7 (177), p. 3.
Hemiaster Wetherbyi de Loriol, 1887. Recueil Zoologique Suisse, f. 4, pp. 391–394, Pl. 17, Figs. 5–8.
Hemiaster incrassatus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test small, oval, cordate, inflated, rounded before, truncated behind; upper surface elevated posteriorly, sloping anteriorly; anterior groove short, not reaching the ambitus. Ambulacra straight, depressed above. Apical disk excentric and posterior. Mouth opening bilabiate and near the anterior border. Anal opening small, high above posterior margin. Fasciole distinct.

Dimensions.—Length, 1 inch; width, $\frac{7}{8}$ inch; height, $\frac{5}{8}$ inch.

Description.—This form was originally described by Morton in 1830, and later, in 1833, considered by the same writer as the young of the species for which the name *parastatus* was then substituted. In presenting a preliminary notice of the present report the writer followed

Morton in this regard, but the examination of a larger amount of material shows that the new species, *H. incrassatus*, there described is only a large form of *H. stella*, so that it becomes necessary to discard the former term and employ both *H. stella* and *H. parastatus* of Morton. *Hemiaster Wetherbyi* de Loriol is apparently identical with *H. stella* Morton.

The test is small, oval, and cordate, and much elevated on the posterior portion of the upper surface. The whole test has a rounded, full outline, that is much increased by the absence of the usually deep anterior groove, which in *H. stella* does not reach the margin (Pl. XLVI, Fig. 1*a*). The posterior border is flatly and nearly vertically truncated.

The ambulacral areas are depressed in the petaloidal portions which, in the antero-lateral pair, are twice as long as in the postero-lateral. The poriferous zones are narrow; the pores have transverse slit-like openings. The unpaired ambulacrum is situated in the anterior groove.

The surface of the test is covered with innumerable small tubercles, between which is a microscopic granulation. The peripetalous fasciole is very distinct, oval, and passes with a regular curve about the ends of the petaloidal areas. The surface of the test is covered with minute tubercles, between which are microscopic granules. The apical disk is small, and situated posteriorly to the center of the upper surface of the test.

The mouth opening is transversely oval, bilabiate, and placed near the anterior margin. The anal opening is small, oval, and situated at the upper part of the truncated posterior margin.

Related forms.—Hemiaster stella is unique among American Hemiasters. The shallow anterior groove, that falls short of the margin, and the full elevated test readily distinguish it from other forms.

Locality and geological horizon.—Hemiaster stella is found in the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collections.—U. S. National Museum; Philadelphia Academy of Natural Sciences; Johns Hopkins University.

HEMIASTER UNGULA (Morton).

Plate XLVI, Figs. 2*a*–*g*.

Spatangus sp. Morton, 1830. Am. Jour. Sci., 1st ser., vol. 17, p. 286.
Spatangus ungula Morton, 1833. Am. Jour. Sci., 1st ser., vol. 23, p. 131, Pl. 10, Fig. 6.
Spatangus ungula Morton, 1834. Synop. Organ. Remains, Cretaceous, p. 78, Pl. 10, Fig. 6.
Micraster ungula Agassiz and Desor, 1847. Cat. rais., p. 141.
Spatangus ungula Bronn, 1848. Index Pal., vol. 1, p. 1161.
Holaster ungula Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Hemiaster angula Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test oval, cordiform, elevated; upper surface inflated, elevated posteriorly; lower surface flat; sides sloping; anterior sulcus narrow and deep. Ambulacra narrow; poriferous zones straight, depressed, petaloidal. Peripetalous fasciole deeply bent inward between the anterior and posterior paired ambulacra. Apical disk small, compact. Mouth opening transversely oval near anterior margin. Anal opening oval, supramarginal.

Dimensions.—Length, 1¼ inches; width, 1⅛ inches; height, ⅞ inch.

Description.—This species has an oval, cordate test, that is very much elevated in the posterior portion. Anteriorly the upper surface slopes rapidly, so that the margin is much thinned down, losing the full round aspect of the previously described forms. The sharp ridge on the posterior portion of the test is terminated by a nearly vertical truncation of the posterior margin. The base is flat, save for the peristomial depression.

The ambulacral areas are narrow. The poriferous zones are petaloidal, straight, and deeply depressed on the upper surface. The unpaired ambulacrum is placed in the anterior sulcus and but slightly exceeds the other areas in width. The petals of the antero-lateral pair are twice the length of the postero-lateral. The pores of the paired ambulacra are elongated and separated (Pl. XLVI, Fig. 2*e*), those of the single ambulacrum small, oval, and approximated (Pl. XLVI, Fig. 2*f*).

The surface of the test is covered with small tubercles, between which are numerous minute granules. The peripetalous fasciole is distinct and bent outwards between the anterior and posterior paired ambulacra.

The apical disk is small and situated posterior to the center of the upper surface. The antero-lateral genital plate is very large and widely separates the posterior pair of oculars. The postero-lateral genitals have large perforations (Pl. XLVI, Fig. 2*g*).

The mouth opening is transversely oval, bilabiate, with a prominently projecting lower lip. The anal opening is large and situated at the upper part of the truncated face of the posterior margin.

Related forms.—It is separated from *Hemiaster parastatus*, with which it is found, by the narrower anterior groove, more central apical disk, less inflated sides, sharper posterior keel, and straight ambulacral plates.

Locality and geological horizon.—*Hemiaster ungula* is from the yellow limestone of the middle marl bed (upper Cretaceous) of Timber creek, New Jersey.

Collections.—Philadelphia Academy of Natural Sciences; American Museum of Natural History, New York.

HEMIASTER TEXANUS Roemer.

Plate XLVII, Figs 1*a*–*i*.

Hemiaster texanus Roemer, 1849. Texas, etc., p. 393.
Hemiaster texanus Roemer, 1852. Die Kreidebildungen von Texas, p. 85. Pl. 10, Fig. 4.
Hemiaster americanus Giebel, 1853. Jahresber. d. Naturw. Ver. in Halle, p. 372, 373.
Hemiaster texanus Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 19.
Hemiaster texanus Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 3.
Hemiaster texanus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinitive characters.—Test oval, cordate, declining anteriorly, elevated slightly posteriorly; anterior sulcus broad and deep, producing groove in margin. Ambulacra broadly depressed on upper surface; antero-lateral pair bent backward in upper part; unpaired ambulacrum very broad. Apical disk compact, the four genitals distinctly perforated. Mouth opening large, transversely oval, bilabiate. Anal opening large, oval, at center of truncated surface of posterior margin.

Dimensions.—Length, 1¼ to 2 inches; width, 1⅛ to 1¾ inches; height, ⅝ to 1 inch.

Description.—This important species is broadly cordate and slightly depressed on the upper surface; base flat. Posterior to the apex there is a sharp ridge that declines gradually toward the obliquely truncated margin. Anteriorly the upper surface declines toward the anterior border.

The ambulacral areas are broad, very unequal, and depressed in the petaloidal portions. The poriferous zones are broad, the pores of the paired ambulacra elongated (Pl. XLVII, Fig. 1*e*), those of the single ambulacrum round and approximated (Pl. XLVII, Fig. 1*f*). The petals of the antero-lateral pair are bent backward in their upper part and are nearly twice the width of the postero-lateral pair. The single ambulacrum is very broad, the poriferous zones widely separated.

The surface of the test is covered with small tubercles that are perforated and for the most part crenulated (Pl. XLVII, Fig. 1*h*, 1*i*). A microscopic granulation fills the intertubercular space.

The apical disk is small and compact and situated near the center. The four genital plates are distinctly perforated; the antero-lateral is larger than the others and serves as the madreporite. The five oculars are wedged between the genitals and are deeply cut by the upper portions of the ambulacra (Pl. XLVII, Fig. 1*g*).

The mouth opening is large, transversely oval, and bilabiate. The anal opening is large, oval, and situated in the center of the truncated surface of the posterior margin (Pl. XLVII, Fig. 1*d*).

Related forms.—Under the name of *Hemiaster americanus*, Giebel published the description of a new species of Hemiaster, in 1853, that he states can be with difficulty distinguished from *H. texanus*. It is considered identical in the present report. The differences seem hardly to warrant the establishment of a new species. *Periaster australis*, described by Gabb, from Peru, so far as the figures and description show, must be a Hemiaster, and to all appearances is closely allied if not identical with *H. texanus*.

Locality and geological horizon.—*Hemiaster texanus* is from the upper division of the Cretaceous of Texas. It is characteristic of the Austin chalk.

Collections.—U. S. National Museum; Prof. Robt. T. Hill.

HEMIASTER HUMPHREYSANUS Meek and Hayden.

Plate XLVIII, Figs. 1*a–f*.

Hemiaster (?) *Humphreysanus* Meek and Hayden, 1857. Philadelphia Acad. Nat. Sci. Proc., vol. 9, pp. 147, 148.

Hemiaster (?) *Humphreysanus* Gabb, 1859. Cat. Invert. Fossils Cretaceous, p. 19.

Hemiaster (?) *Humphreysanus* Meek, 1864. Smith. Misc. Coll., vol. 7 (177), p. 3.

Hemiaster Humphreysanus Meek. U. S. Geol. Surv. of the Territories, vol. 9, pp. 5, 6, Pl. 10, Figs. 1*a–g*.

Hemiaster Humphreysanus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test oval, cordate; upper surface high, flat, with broad, vertical truncation on posterior margin, and long anterior groove; base flat; sides rounded. Ambulacra in deep furrows that reach to the edge of the elevated sides. Apical disk large and compact, posteriorly situated. Mouth opening small, transversely oval, and bilabiate. Anal opening oval, situated high on posterior margin.

Dimensions.—Length, 1⅛ inches; width, 1⅛ inches; height, ¾ inch.

Description.—The absence of distinct fascioles on the type specimens of this species caused Meek and Hayden to place it doubtfully in the genus Hemiaster, to which beyond doubt it belongs. The test is full, the sides rounded, and the high upper surface distinctly flattened. The base is also flat, with the exception of the peristomial depression. The situation of the apex so far posterior to the center of the upper surface produces a long anterior sulcus, that grooves the anterior margin. A high, vertically truncated surface terminates the posterior margin.

The ambulacral areas are broad, very unequal, and deeply depressed on the upper surface. The petals of the postero-lateral pair are very short, those of the antero-lateral very long, the latter quite three times the length of the former. The unpaired ambulacrum occupies the long anterior sulcus. The antero-lateral pair are bent backward in the upper part and forward in the lower. The poriferous zones are broad, the pores distinct and oval (Pl. XLVIII, Figs. 1*e*, 1*f*). Since much of the surface of the test has suffered removal the character of the tubercles and granules can not be fully determined.

The apical disk, which has been largely destroyed, was large, compact, and situated far posterior to the center of the upper surface.

The mouth opening is small and situated near the anterior margin. The anal opening is oval and situated on the vertically truncated surface of the posterior margin (Pl. XLVIII, Fig. 1*d*).

Related forms.—*Hemiaster Humphreysanus* is a unique form, that is not closely related to any species of Hemiaster hitherto described.

Locality and geological horizon.—This species is from the Fort Pierre formation (upper Cretaceous) of Meek and Hayden and was found 150 miles from the mouth of the Yellowstone river in Montana.

Collection.—U. S. National Museum.

HEMIASTER DALLI Clark.

Plate XLVIII, Figs. 2*a–e*.

Hemiaster Dalli Clark, 1891. Johns Hopkins University Circulars, No. 87, pp. 77.

Determinative characters.—Test cordate, subhexagonal, depressed; upper surface with sharp ridges between the ambulacral furrows; base flat; sides rapidly declining; anterior margin deeply grooved. Ambulacra unequal, very deeply depressed on petaloidal portions; antero-lateral pair much bent in upper part. Mouth opening transversely oval, near anterior margin. Anal opening oval, situated on vertically truncated surface of posterior margin.

Dimensions.—Length, 1¾ inches; width, 1⅝ inches; height, ⅝ inch.

Description.—This species is much depressed, with distinct marginal angles that give it a subhexagonal outline. Prominent ridges cross the upper surface between the ambulacral furrows. The anterior sulcus cuts deeply into the test and grooves the anterior margin. The sides decline rapidly to the flattened base. The low posterior surface has a nearly vertical truncation of small area.

The ambulacral areas are very deeply depressed on the upper surface, a feature much more pronounced than in any other American species. The antero-lateral pair are bent backward in their upper part, and have long, deep furrows. The postero-lateral pair are about one-half the length of the anterior pair. The single ambulacrum is situated in the broad, deep, anterior sulcus. The poriferous zones in the paired ambulacrum are broad, the pores oval, those of each pair united by a shallow furrow (Pl. XLVIII, Fig. 2*e*). In the unpaired ambulacrum the poriferous zones are narrow, the pores small and approximated.

The surface is covered with small tubercles with sunken areolas that increase in size toward the base, where they are large, with distinctly perforated mamelons and crenulated bosses. A fine microscopic granulation fills the interspaces.

The apical disk is sunken, small, and posterior to the center of the upper surface.

The mouth opening is transversely oval and close to the anterior margin.

The anal opening is oval and situated on the truncated surface of the posterior border (Pl. XLVIII, Fig. 2*d*).

Related forms.—The very deep ambulacral furrows and angular outline readily separate *Hemiaster Dalli* from any other American species. It is not closely allied to any European form.

Locality and geological horizon.—This form is from the Washita formation of the Comanche series (lower Cretaceous) of Bexar county, Texas.

Collection.—U. S. National Museum.

HEMIASTER CALIFORNICUS Clark.

Plate XLIX, Figs. 1*a–c*.

Hemiaster californicus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test small, subquadrate, depressed; upper surface flat, with shallow anterior sulcus, sloping sides, and low truncated posterior margin; lower surface flat. Ambulacra depressed, in shallow furrows. Apical disk small, posterior to center. Mouth opening transversely oval near anterior margin. Anal opening situated on the low truncated surface of the posterior margin.

Dimensions.—Length, 1 inch; width, 1 inch; height, ¼ inch.

Description.—This form, the single representative of the Echinodermata thus far obtained from the Cretaceous deposits of California, has the details of its structure poorly preserved in the specimens examined, although it belongs, beyond much doubt, to the genus *Hemiaster*. The test is small, much depressed, and subquadrate in ambital outline. It is broader anteriorly, with a feeble groove in the center of the anterior margin. The posterior portion of the test is but slightly more elevated than the anterior, and the truncated margin is low and narrow. The base is flat, with the exception of the peristomial depression.

The ambulacral areas are but slightly depressed in the petaloidal portions. The poriferous zones are broad, and the oval pores are united by shallow furrows (Pl. XLIX, Fig. 1*a*).

The apical disk is small and situated slightly forward of the center.

The mouth opening is transversely oval and situated near the anterior margin (Pl. XLIX, Fig. 1*b*). The anal opening is small, oval, and situated on the low, truncated surface of the posterior border.

Related forms.—On account of its shallow ambulacral furrows, *Hemiaster californicus* may be compared to *H. Humphreysanus*, but is readily separated from it by means of its more central apical disk and its depressed form. It is a very unique species.

Locality and geological horizon.—*H. californicus* is from Redding, Shasta county, California, in deposits that have been referred to the Chico group (upper Cretaceous).

Collection.—U. S. National Museum.

HEMIASTER CALVINI Clark.

Plate XLIX, Figs. 2*a–i*.

Determinative characters.—Test oval, cordate, inflated; upper surface elevated; lower surface flat; posterior margin obliquely truncated. Ambulacra moderately depressed on the upper surface. Mouth opening transversely oval. Anal opening oval, high on truncated posterior border.

Dimensions.—Length, 1½ inches; width, 1¼ inches; height, ⅞ inch.

Description.—This species has an elevated test that is oval, cordate, and broadly truncated on the posterior margin. The anterior sulcus is shallow, and produces but a feeble groove on the anterior margin. The base is flat.

The ambulacral areas are narrow. The poriferous zones are broad; the petals moderately depressed and of good length; the pores in the petaloidal portions of the paired ambulacra elongated, slit-like (Pl. XLIX, Fig. 2*e*), those of the unpaired ambulacrum small and approximated (Pl. XLIX, Fig. 2*g*). Beyond the petals the pores are very small, and occupy the lower outside corner of each plate (Pl. XLIX, Fig. 2*f*).

The surface of the plates is covered with small perforated tubercles, rather widely scattered, between which a microscopic granulation intervenes. The peripetalous fasciole is indistinct.

The apical disk is small, compact, and nearly central (Pl. XLIX, Fig. 2*i*).

The mouth opening is small, transversely oval, and situated at a distance from the margin.

The anal opening is oval and situated high on the truncated surface of the posterior margin.

Related forms.—Hemiaster Calvini is most closely related to *H. texanus*, from which, however, it is separated by its more elevated form and small, narrow, anterior sulcus. The apical disk is also more excentric.

Locality and geological horizon.—Hemiaster Calvini is from the Shoal creek limestone at the top of the Comanche series (lower Cretaceous) of Texas. It is found in Travis county.

Collections.—U. S. National Museum; University of Iowa.

LINTHIA Merian.

LINTHIA TUMIDULA Clark.

Plate L, Figs. 1*a–i*.

Linthia tumidula Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Determinative characters.—Test oval, cordiform, elevated; apex central; posterior border obliquely truncated, anterior portion grooved by narrow sulcus; sides sloping. Ambulacral furrows long, straight, depressed; poriferous zones broad, pores oval. Apical disk small, nearly central. Anal opening on truncated posterior border. Peripetalous and lateral fascioles distinct.

Dimensions.—Length, 2⅛ inches; width, 2 inches; height, 1¼ inches.

Description.—This large form has an elevated test, with flattened, sloping sides, oval outline, and a narrow, moderately depressed anterior sulcus that grooves the anterior margin. The base is flat, except for the peristomial depression.

The ambulacral areas are narrow and furrow for a long distance the upper surface of the test to a moderate depth. The poriferous zones are broad and straight. The pores are large and oval, and those of each pair connected by a shallow furrow (Pl. L, Fig, 1*f*). The anterolateral petals reach far down the sloping sides and are about one and one-half times as long as the postero-lateral pair.

The surface of the test is covered with minute, perforated tubercles that are much larger on the base than on the upper surface. A microscopic granulation fills the space between the tubercles (Pl. L, Fig. 1*i*). Both the peripetalous and lateral fascioles can be readily traced.

The apical disk is small, nearly central, and slightly depressed (Pl. L, Fig. 1*g*).

The mouth opening is transversely oval and situated near the anterior margin. The anal opening is small, oval, and situated but a short distance above the posterior margin (Pl. L, Fig. 1*d*).

Related forms.—*L. tumidula* is the only representative of the genus from American deposits. It is not closely allied to any species described elsewhere.

Locality and geological horizon.—*Linthia tumidula* is from the yellow limestone of the middle marl bed (upper Cretaceous), of Timber creek, New Jersey.

Collections.—American Museum of Natural History, New York; BostonSociety of Natural History.

DOUBTFUL AND UNRECOGNIZED SPECIES.

With few exceptions the writer has had an opportunity of examining the type forms of previous writers upon the Mesozoic Echinodermata of the United States, and as a result *Cassidulus abruptus* Conrad, *Arbacia* sp. Roemer, and Diadema sp. Roemer are the only species that can not be identified. Three other species—two from lack of generic characters (*Pygurus* (?) *geometricus* (Morton) and *Cidaris nahalakensis* de Loriol), the third (*Discoidea occidentale* Gabb) because of probable foreign origin—are not included, although the synonymy of each is given for purposes of reference. A single specific name (*Holectypus simplex* Roemer) has found its way into the literature from its use in Gabb's Catalogue, although probably mentioned by mistake.

CASSIDULUS ABRUPTUS Conrad.

Cassidulus abruptus Conrad, 1860. Philadelphia Acad. Nat. Sci. Jour., new ser., vol. 4, p. 291.

Cassidulus abruptus Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

This species, originally described by Conrad in 1860, but not figured, is from Tippah county, Mississippi. It has not been recognized in material examined by the writer, so that its relations to the other forms described are not known.

PYGURUS (?) GEOMETRICUS (Morton).

Clypeaster sp. Morton, 1830. Philadelphia Acad. Sci. Jour., 1st ser., vol. 6, p. 202.

Clypeaster geometricus Morton, 1833. Am. Jour. Sci., 1st ser., vol. 24, p. 131, Pl. 10, Fig. 9.

Clypeaster geometricus Morton, 1834. Synop. Organ. Remains, Cretaceous, p. 76, Pl. 10, Fig. 10.
Pygurus geometricus Agassiz and Desor, 1847. Cat. rais., p. 141.
Pygurus geometricus d'Orbigny, 1847. Prodrome, vol. 2, p. 270.
Clypeaster geometricus Bronn, 1848. Index Pal. vol. 1, p. 312.
Pygurus geometricus d'Orbigny, 1853-'60. Paléont. française, vol. 6, p. 313, Pl. 920, Fig. 4.
Pygurus geometricus Desor, 1858. Synop. des Échinides fossiles, p. 313.
Clypeaster geometricus Gabb, 1859. Cat. Invert. Fossils, Cretaceous, p. 18.
Pygurus (?) *geometricus* Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

The type of this species was examined by the writer, but its state of preservation (that of a poor cast) is such that its generic relations cannot be with certainty determined. Until further material is obtained it seems best to defer its recognition.

Although originally described by Morton as a Clypeaster, it has been referred to the genus Pygurus by Agassiz, d'Orbigny, and Desor. The single specimen was obtained from the lower marl bed (upper Cretaceous) of the Delaware and Chesapeake canal.

CIDARIS NAHALAKENSIS de Loriol.

Cidaris nahalakensis de Loriol, 1887. Recueil Zoölogique suisse, tome 4, pp. 388, 389, Pl. 17, Figs. 3-4.

The present species is based by P. de Loriol upon fragment of spines obtained from the Rotten limestone of the upper Cretaceous of Nahalak, Kemper county, Mississippi. The acceptance of the species is reserved until fuller material has been obtained. Similar spines have been recognized by the writer from other localities, but whether they represent an independent species or one hitherto described is not yet clear.

DISCOIDEA OCCIDENTALE Gabb.

Discoidea occidentale Gabb, 1860. Philadelphia Acad. Nat. Sci. Jour., new ser., vol. 4. p. 398, Pl. 68, Figs. 42-44.
Discoidea occidentale Gabb, 1876. Philadelphia Acad. Nat. Sci. Proc., vol. 28, p. 323.
Discoidea occidentale Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77,

When first described in 1860 Gabb referred this form to the Cretaceous of Oregon, but later, in 1876, thought he might have been mistaken in the locality and mentioned Peru as its probable origin. In view of this doubt it is omitted from the list of species.

? HOLECTYPUS SIMPLEX Shumard.

? *Holectypus simplex* Shumard (description unknown).
Holectypus simplex Meek, 1864. Smith Misc. Coll., vol. 7 (177), p. 2.
? *Holectypus simplex* Clark, 1891. Johns Hopkins University Circulars, No. 87, p. 77.

Meek includes *Holectypus simplex* Shumard among his list of American Cretaceous Echinodermata and gives Texas as the locality. As a careful search of the literature and extended correspondence with those familiar with Shumard's writings fail to elicit any information upon this point, the writer is of the opinion that the reference to this species by Meek is a mistake. No such species was probably ever described.

GEOLOGICAL DISTRIBUTION.

	Trias.	Jura.	Lower Cretaceous.	Upper Cretaceous.
CRINOIDEA:				
Uintacrinidæ—				
Uintacrinus socialis Grinnell				×
Apiocrinidæ—				
Bourgueticrinus alabamensis de Loriol				×
Pentacrinidæ—				
Pentacrinus asteriscus Meek and Hayden		×		
Pentacrinus Whitei Clark	× (?)	×		
Pentacrinus Bryani Gabb				×
ASTEROÏDEA:				
Ophiuridæ—				
Ophioglypha bridgerensis (Morton)				×
Ophioglypha texana Clark			×	
Stelleridæ—				
Asterias (?) dubium Whitfield		×		
Goniaster mammillata Gabb				×
ECHINOIDEA:				
Euechinoidea—				
Regulares—				
Cidaridae—				
Cidaris taylorensis Clark		×		
Cidaris californicus Clark		×		
Cidaris splendens Morton				×
Cidaris Walcotti Clark				×
Cidaris texanus Clark			×	
Leiocidaris hemigranosus (Shumard)			×	
Salenidae—				
Salenia texana Credner			×	
Salenia tumidula Clark				×
Salenia bellula Clark				×
Diadematidæ—				
Hemicidaris intumescens Clark		×		
Pseudodiadema Emersoni Clark		×		
Pseudodiadema diatretum (Morton)				×
Pseudodiadema texanum (Roemer)			×	
Diplopodia texanum (Roemer)			×	
Diplopodia Hilli Clark				×
Coptosoma speciosum Clark				×
Coptosoma Mortoni (de Loriol)				×
Goniopygus Zitteli Clark			×	
Echinidæ—				
Psammechinus cingulatus Clark				×
Stomechinus Hyatti Clark		×		
Pedinopsis Pondi Clark				×
Irregulares—				
Echinoconidæ—				
Holectypus planatus Roemer			×	
Cassidulidæ—				
Pyrina Parryi Hall			×	
Botriopygus alabamensis Clark				×
Echinobrissus expansus Clark				×
Echinobrissus texanus Clark				×
Trematopygus crucifer (Morton)				×
Catopygus oviformis Conrad				×
Catopygus pusillus Clark				×
Cassidulus florealis (Morton)				×
Cassidulus æquoreus Morton				×
Cassidulus micrococcus Gabb				×
Cassidulus subquadratus Conrad				×
Cassidulus subconicus Clark				×
Cassidulus porrectus Clark				×
Cassidulus Stantoni Clark				×
Holasteridae—				
Ananchytes ovalis Clark				×
Cardiaster cinctus (Morton)				×
Holaster simplex Shumard			×	
Spatangidae—				
Enallaster texanus (Roemer)			×	
Enallaster obliquatus Clark			×	
Epiaster elegans (Shumard)			×	
Epiaster Whitei Clark			×	
Hemiaster stella (Morton)				×
Hemiaster parastatus (Morton)				×
Hemiaster ungula (Morton)				×
Hemiaster texanus Roemer				×
Hemiaster Humphreysanus Meek and Hayden				×
Hemiaster Dalli Clark			×	
Hemiaster californicus Clark				×
Hemiaster Calvini Clark			×	
Linthia tumidula Clark				×

CATALOGUE OF SPECIFIC NAMES EMPLOYED BY WRITERS UPON THE MESOZOIC ECHINODERMATA OF THE UNITED STATES.

	Page
Ananchytes sp. Morton, 1830=Cardiaster cinctus (Morton)	75
cinctus Morton, 1830=Cardiaster cinctus (Morton	75
cinctus Morton, 1834=Cardiaster cinctus (Morton)	75
cinctus Gabb, 1859=Cardiaster cinctus (Morton)	75
cruciferus Morton, 1830=Trematopygus crucifer (Morton)	63
fimbriatus Morton, 1830=Cardiaster cinctus (Morton)	75
fimbriatus Morton, 1834=Cardiaster cinctus (Morton)	75
fimbriatus Bronn, 1848=Cardiaster cinctus (Morton)	75
fimbriatus Gabb, 1859=Cardiaster cinctus (Morton)	75
ovalis Clark	74
Arbacia sp. Roemer, 1849=unrecognized	92
Asterias ? dubium Whitfield, 1877	31
? dubium Clark=Asterias dubium Whitfield	31
Botriopygus alabamensis Clark	60
Bourgueticrinus alabamensis de Loriol, 1882	25
alabamensis Clark=Bourgueticrinus alabamensis de Loriol	25
Cardiaster cinctus (Morton)	75
cinctus d'Orbigny, 1853-'60=Cardiaster cinctus (Morton)	75
cinctus (fimbriatus) Desor, 1858=Cardiaster cinctus (Morton)	75
cinctus Clark=Cardiaster cinctus (Morton)	75
fimbriatus d'Orbigny, 1853-'60=Cardiaster cinctus (Morton)	75
Cassidulus abruptus Conrad, 1860	92
æquoreus Morton, 1834	68
æquoreus Desmoulins, 1837=Cassidulus æquoreus Morton	68
æquoreus Agassiz, 1847=Cassidulus æquoreus Morton	68
æquoreus d'Orbigny, 1847=Cassidulus æquoreus Morton	68
æquoreus Bronn, 1848=Cassidulus æquoreus Morton	68
æquoreus d'Orbigny, 1853-'60=Cassidulus æquoreus Morton	68
æquoreus Desor, 1858=Cassidulus æquoreus Morton	68
æquoreus Gabb, 1859=Cassidulus æquoreus Morton	68
æquoreus Meek, 1864=Cassidulus æquoreus Morton	68
æquoreus Conrad, 1868=Cassidulus æquoreus Morton	68
æquoreus Clark=Cassidulus æquoreus Morton	68
florealis (Morton)	66
florealis Meek, 1864=Cassidulus florealis (Morton).	66
florealis Clark=Cassidulus florealis (Morton)	66
micrococcus Gabb, 1860	69
micrococcus Clark=Cassidulus micrococcus Gabb	69
porrectus Clark, 1891	72
Stantoni Clark, 1891	73
subconicus Clark, 1891	71
subquadratus Conrad, 1860	70
subquadratus Clark=Cassidulus subquadratus Conrad	70

Page.
Catopygus oviformis Conrad, 1847 64
  oviformis Clark=Catopygus oviformis Conrad 64
  pusillus Clark 65
Cidaris sp. Morton, 1829=Cidaris splendens Morton 33
  armiger Gabb, 1859=Cidaris splendens Morton 33
  armiger Clark=Cidaris splendens Morton 33
  californicus Clark 36
  clavigera Credner, 1870=Pseudodiadema diatretum (Morton) 46
  diatretum Morton, 1833=Pseudodiadema diatretum (Morton) 46
  diatretum Bronn, 1848=Pseudodiadema diatretum (Morton) 46
  diatretum Gabb, 1859=Pseudodiadema diatretum (Morton) 46
  diatretum Giebel, 1853=Salenia texana Credner 40
  hemigranosus Shumard, 1860=Leiocidaris hemigranosus (Shumard) 38
  hemigranosus Meek, 1864=Leiocidaris hemigranosus (Shumard) 38
  hemigranosus White, 1883=Leiocidaris hemigranosus (Shumard) 38
  nahalakensis de Loriol, 1887 93
  nahalakensis Clark=Cidaris nahalakensis de Loriol 93
  sceptrifera Credner, 1870=Pseudodiadema diatretum Morton 46
  splendens Morton 33
  splendens Clark=Cidaris splendens Morton 33
  splendens Gabb, 1859=Cidaris splendens Morton 33
  taylorensis Clark 35
  texanus Clark, 1891 36
  Walcotti Clark, 1891 37
Cidarites armiger Morton, 1842=Cidaris splendens Morton 33
  diatretum Morton, 1834=Pseudodiadema diatretum (Morton) 46
  splendens Morton, 1841=Cidaris splendens Morton 33
Clypeaster sp. Morton, 1829=Cassidulus florealis (Morton) 66
  geometricus Morton, 1833=Pygurus (?) geometricus (Morton) 92
  geometricus Morton, 1834=Pygurus (?) geometricus (Morton) 92
  geometricus Bronn, 1848=Pygurus (?) geometricus (Morton) 92
  geometricus Gabb, 1859=Pygurus (?) geometricus (Morton) 92
  florealis Morton, 1833=Cassidulus florealis (Morton) 66
  florealis Morton, 1834=Cassidulus florealis (Morton) 66
  florealis Bronn, 1848=Cassidulus florealis (Morton) 66
  florealis Gabb, 1859=Cassidulus florealis (Morton) 66
Coptosoma Mortoni (de Loriol) 51
  speciosum Clark, 1891 52
Cyphosoma Mortoni de Loriol, 1887=Coptosoma Mortoni (de Loriol) 51
  speciosum Clark, 1891=Coptosoma speciosum Clark 52

Page.

- Cyphosoma texanum Roemer, 1852=Diplopodia texanum (Roemer) ... 48
  - texanum Conrad, 1857=Diplopodia texanum (Roemer) ... 48
  - texanum Gabb, 1859=Diplopodia texanum (Roemer) ... 48
  - texanum Gabb, 1869=Diplopodia texanum (Roemer) ... 48
- Diadema sp. Roemer, 1852=unrecognized ... 92
  - diatretum Agassiz and Desor, 1847=Pseudodiadema diatretum (Morton) ... 46
  - texanum Roemer, 1849=Diplopodia texanum (Roemer) ... 48
  - texanum Roemer, 1852=Pseudodiadema texanum (Roemer) ... 47
  - texanum Gabb, 1859=Pseudodiadema texanum (Roemer) ... 47
- Diplopodia texanum (Roemer) ... 48
  - texanum Clark=Diplopodia texanum (Roemer) ... 48
  - Hilli Clark, 1891 ... 50
- ?Discoidea occidentale Gabb, 1860 ... 93
  - occidentale Gabb, 1876=Discoidea occidentale Gabb ... 93
  - occidentale Clark, 1876=Discoidea occidentale Gabb ... 93
- Echinobrissus cruciferus d'Orbigny, 1854=Trematopygus crucifer (Morton) ... 63
  - expansus Clark, 1891 ... 61
  - texanus Clark, 1891 ... 62
- Echinus sp. Morton, 1830=Cidaris splendens Morton ... 33
- Enallaster obliquatus Clark ... 79
  - texanus (Roemer) ... 78
  - texanus Desor, 1858=Enallaster texanus (Roemer) ... 78
  - texanus Clark=Enallaster texanus (Roemer) ... 78
  - texasus d'Orbigny, 1853-'60=Enallaster texanus (Roemer) ... 78
- Encrinites sp. Shiel, 1855=Pentacrinus asteriscus Meek and Hayden ... 26
- Epiaster elegans (Shumard) ... 80
  - elegans Clark=Epiaster elegans (Shumard) ... 80
  - Whitei Clark, 1891 ... 82
- Faujasia florealis d'Orbigny, 1853-'60=Cassidulus florealis (Morton) ... 66
  - florealis Desor, 1858=Cassidulus florealis (Morton) ... 66
- Goniaster mammillata Gabb, 1876 ... 32
  - mammillata Clark=Goniaster mammillata Gabb ... 32
- Goniopygus Zitteli Clark, 1891 ... 53
- Hemiaster americanus Giebel, 1853=Hemiaster texanus Roemer ... 86
  - californicus Clark, 1891 ... 90
  - Calvini Clark ... 89
  - Dalli Clark, 1891 ... 80
  - elegans Shumard, 1853=Epiaster elegans (Shumard) ... 88
  - Humphreysanus Meek & Hayden, 1857 ... 88
  - Humphreysanus Gabb, 1859=Hemiaster Humphreysanus Meek & Hayden ... 88

Page.
Hemiaster ?Humphreysanus Meek, 1864=Hemiaster Humphreysanus Meek & Hayden 88
Humphreysanus Meek, 1876=Hemiaster Humphreysanus Meek & Hayden 88
Humphreysanus Clark=Hemiaster Humphreysanus Meek & Hayden 88
incrassatus Clark, 1891=Hemiaster stella (Morton) 84
parastatus (Morton) 83
parastatus Desor, 1847=Hemiaster parastatus (Morton) 83
parastatus d'Orbigny, 1847=Hemiaster parastatus (Morton) 83
parastatus d'Orbigny, 1853–'60=Hemiaster parastatus (Morton) 83
parastatus Desor, 1858=Hemiaster parastatus (Morton) 83
parastatus Gabb, 1859=Hemiaster parastatus (Morton) 83
parastatus Meek, 1864=Hemiaster parastatus (Morton) 83
parastatus, Clark=Hemiaster parastatus (Morton) 83
stella (Morton) 84
stella Agassiz & Desor, 1847=Hemiaster stella (Morton) 84
stella Desor, 1858=Hemiaster stella (Morton) 84
stella Gabb, 1859=Hemiaster stella (Morton) 84
?stella Meek, 1864=Hemiaster stella (Morton) 84
stella Clark=Hemiaster stella (Morton) 84
texanus Roemer, 1849 86
texanus Roemer, 1852=Hemiaster texanus Roemer 86
texanus Gabb, 1859=Hemiaster texanus Roemer 86
texanus Meek, 1864=Hemiaster texanus Roemer 86
texanus Clark=Hemiaster texanus Roemer 86
Wetherbyi de Loriol, 1887=Hemiaster stella (Morton) 84
ungula (Morton) 85
ungula Clark=Hemiaster ungula (Morton) 85
Hemicidaris intumescens Clark 44
Holaster cinctus Agassiz, 1840=Cardiaster cinctus (Morton) 75
cinctus Agassiz and Desor, 1847=Cardiaster cinctus (Morton) 75
cinctus d'Orbigny, 1847=Cardiaster cinctus (Morton) 75
cinctus Bronn, 1848=Cardiaster cinctus (Morton) 75
cinctus Credner, 1870=Cardiaster cinctus (Morton) 75
cinctus Clark, 1891=Cardiaster cinctus (Morton) 75
comanchesi Marcou, 1858=Holaster simplex Shumard 76
comanchesi Desor, 1858=Holaster simplex Shumard 76
comanchesi Gabb, 1859=Holaster simplex Shumard 76
comanchesi Meek, 1864=Holaster simplex Shumard 76
elegans Conrad, 1857 (figure only)=Epiaster Whitei Clark .. 82
fimbriatus Agassiz and Desor, 1847=Cardiaster cinctus (Morton) 75

	Page.
Holaster fimbriatus d'Orbigny, 1847=Cardiaster cinctus (Morton)	75
parastatus Gabb, 1859=Hemiaster parastatus (Morton)	83
simplex Shumard, 1853	76
simplex Desor, 1858=Holaster simplex Shumard	76
simplex Gabb, 1859=Holaster simplex Shumard	76
simplex Meek, 1864=Holaster simplex Shumard	76
simplex Clark=Holaster simplex Shumard	76
ungula Gabb, 1859=Hemiaster ungula (Morton)	85
Holectypus planatus Roemer, 1849	58
planatus Roemer, 1852=Holectypus planatus Roemer	58
planatus Shumard, 1852=Holectypus planatus Roemer	58
planatus Giebel, 1853=Holectypus planatus Roemer	58
planatus Conrad, 1857=Holectypus planatus Roemer	58
planatus Desor, 1858=Holectypus planatus Roemer	58
planatus Gabb, 1859=Holectypus planatus Roemer	58
planatus Meek, 1864=Holectypus planatus Roemer	58
planatus Clark=Holectypus planatus Roemer	58
planus Giebel, 1853=Holectypus planatus Roemer	58
simplex Meek, 1864 (probably accredited to Shumard by mistake)	93
Leiocidaris hemigranosus (Shumard)	38
hemigranosus Clark=Leiocidaris hemigranosus (Shumard)	38
Linthia tumidula Clark	91
Macraster texanus Roemer=Epiaster elegans (Shumard)	80
Micraster ungula Agassiz and Desor, 1847=Hemiaster ungula (Morton)	85
Nucleolites crucifer Morton, 1833=Trematopygus crucifer (Morton)	63
crucifer Morton, 1834=Trematopygus crucifer (Morton)	63
crucifer Bronn, 1848=Trematopygus crucifer (Morton)	63
crucifer d'Orbigny, 1853–'60=Trematopygus crucifer (Morton)	63
crucifer Desor, 1858=Trematopygus crucifer (Morton)	63
crucifer Gabb, 1859=Trematopygus crucifer (Morton)	63
crucifer Meek, 1864=Trematopygus crucifer (Morton)	63
crucifer Cook, 1868=Trematopygus crucifer (Morton)	63
crucifer Conrad, 1868=Trematopygus crucifer (Morton)	63
cruciferus Agassiz, 1840=Trematopygus crucifer (Morton)	63
cruciferus d'Orbigny, 1847=Trematopygus crucifer (Morton)	63
cruciferus Agassiz and Desor, 1847=Trematopygus crucifer (Morton)	63
cruciferus Credner, 1870=Trematopygus crucifer (Morton)	63
Ophioderma (?) bridgerensis Meek, 1873=Ophioglypha bridgerensis (Meek)	29
bridgerensis White, 1883=Ophioglypha bridgerensis (Meek)	29

Page.

- Ophioglypha bridgerensis (Meek) 29
  - bridgerensis Clark=Ophioglypha bridgerensis (Meek) 29
  - texana Clark 30
- Pedinopsis Pondi Clark 57
- Pentacrinus asteriscus Meek & Hayden, 1858 26
  - asteriscus Meek & Hayden, 1860=Pentacrinus asteriscus Meek & Hayden 26
  - asteriscus Meek, 1864=Pentacrinus asteriscus Meek & Hayden 26
  - asteriscus Clark=Pentacrinus asteriscus Meek & Hayden .. 26
  - Bryani Gabb, 1876 28
  - Bryani Clark=Pentacrinus Bryani Gabb 28
  - Whitei Clark 27
- Pentacrinites asteriscus Meek & Hayden, 1865=Pentacrinus asteriscus Meek & Hayden 26
  - (?) asteriscus Whitfield, 1880=Pentacrinus asteriscus Meek & Hayden 26
  - asteriscus White, 1875=Pentacrinus Whitei Clark 27
  - (?) asteriscus (?) Hall & Whitfield, 1877=Pentacrinus Whitei Clark 27
  - (?) asteriscus Whitfield, 1880=Pentacrinus Whitei Clark .. 27
- Phymosoma texanum Desor, 1858=Diplopodia texanum (Roemer) 48
- Psammechinus cingulatus Clark, 1891 55
- Pseudodiadema diatretum (Morton) 46
  - diatretum Desor, 1858=Pseudodiadema diatretum (Morton). 46
  - diatretum Cotteau, 1862–'67=Pseudodiadema diatretum (Morton) 46
  - diatretum Meek, 1864=Pseudodiadema diatretum (Morton). 46
  - diatretum Conrad, 1868=Pseudodiadema diatretum (Morton) 46
  - diatretum Clark=Pseudodiadema diatretum Morton 46
  - Emersoni Clark 45
  - Hilli Clark, 1891=Diplopodia Hilli Clark 50
  - Roemeri Clark, 1891=Pseudodiadema texanum (Roemer) .. 47
  - texanum (Roemer) 47
  - texanum Desor, 1858=Pseudodiadema texanum (Roemer) .. 47
  - texanum Meek, 1864=Pseudodiadema texanum (Roemer) .. 47
  - texanum Clark, 1891=Diplopodia texanum (Roemer) 48
- Pygorhynchus crucifer Ravenel, 1850=Trematopygus crucifer (Morton) 63
- Pygurus florealis Agassiz, 1847=Cassidulus florealis (Morton) .. 66
  - florealis Conrad, 1868=Cassidulus florealis (Morton) 66
  - (?) geometricus (Morton) 92
  - geometricus Agassiz & Desor, 1847=Pygurus (?) geometricus (Morton) 92
  - geometricus d'Orbigny, 1847=Pygurus (?) geometricus (Morton) 92

	Page.
Pygurus geometricus d'Orbigny, 1853–'60=Pygurus (?) geometricus (Morton)	92
geometricus Desor, 1858=Pygurus (?) geometricus (Morton)	92
(?) geometricus Clark=Pygurus (?) geometricus (Morton)	92
Pyrina Parryi Hall, 1857	59
Parryi Gabb, 1859=Pyrina Parryi Hall	59
Parryi Meek, 1864=Pyrina Parryi Hall	59
Parryi Clark=Pyrina Parryi Hall	59
Salenia bellula Clark, 1891	43
texana Credner, 1875	40
texana Clark=Salenia texana Credner	40
tumidula Clark, 1891	41
Spatangus sp. Morton, 1829=Cardiaster cinctus (Morton)	75
sp. Morton, 1830=Hemiaster parastatus (Morton) and Hemiaster ungula (Morton)	83, 85
cor-marinum (?) Morton, 1830=Hemiaster parastatus (Morton)	83
parastatus Morton, 1833=Hemiaster parastatus (Morton)	83
parastatus Morton, 1834=Hemiaster parastatus (Morton)	83
parastatus Bronn, 1848=Hemiaster parastatus (Morton)	83
stella Morton, 1830=Hemiaster stella (Morton)	84
stella Morton, 1834=Hemiaster stella (Morton)	84
ungula Morton, 1833=Hemiaster ungula (Morton)	85
ungula Morton, 1834=Hemiaster ungula (Morton)	85
ungula Bronn, 1848=Hemiaster ungula (Morton)	85
Stomechinus Hyatti Clark	56
Toxaster elegans Conrad, 1857=Epiaster Whitei Clark	82
elegans Gabb, 1859=Epiaster elegans (Shumard)	80
elegans Meek, 1864=Epiaster elegans (Shumard)	80
texanus Roemer, 1849=Enallaster texanus (Roemer)	78
texanus Roemer, 1852=Enallaster texanus (Roemer)	78
texanus Conrad, 1857=Enallaster texanus (Roemer)	78
texanus Gabb, 1859=Enallaster texanus (Roemer)	78
texanus Meek, 1864=Enallaster texanus (Roemer)	78
ungula Giebel, 1853=Enallaster texanus (Roemer)	78
Trematopygus crucifer (Morton)	63
crucifer d'Orbigny, 1853–'60=Trematopygus crucifer (Morton)	63
crucifer Clark=Trematopygus crucifer (Morton)	63
Uintacrinus socialis Grinnell, 1876	21
socialis Meek, 1876=Uintacrinus socialis Grinnell	21
socialis Clark=Uintacrinus socialis Grinnell	21

PLATES.

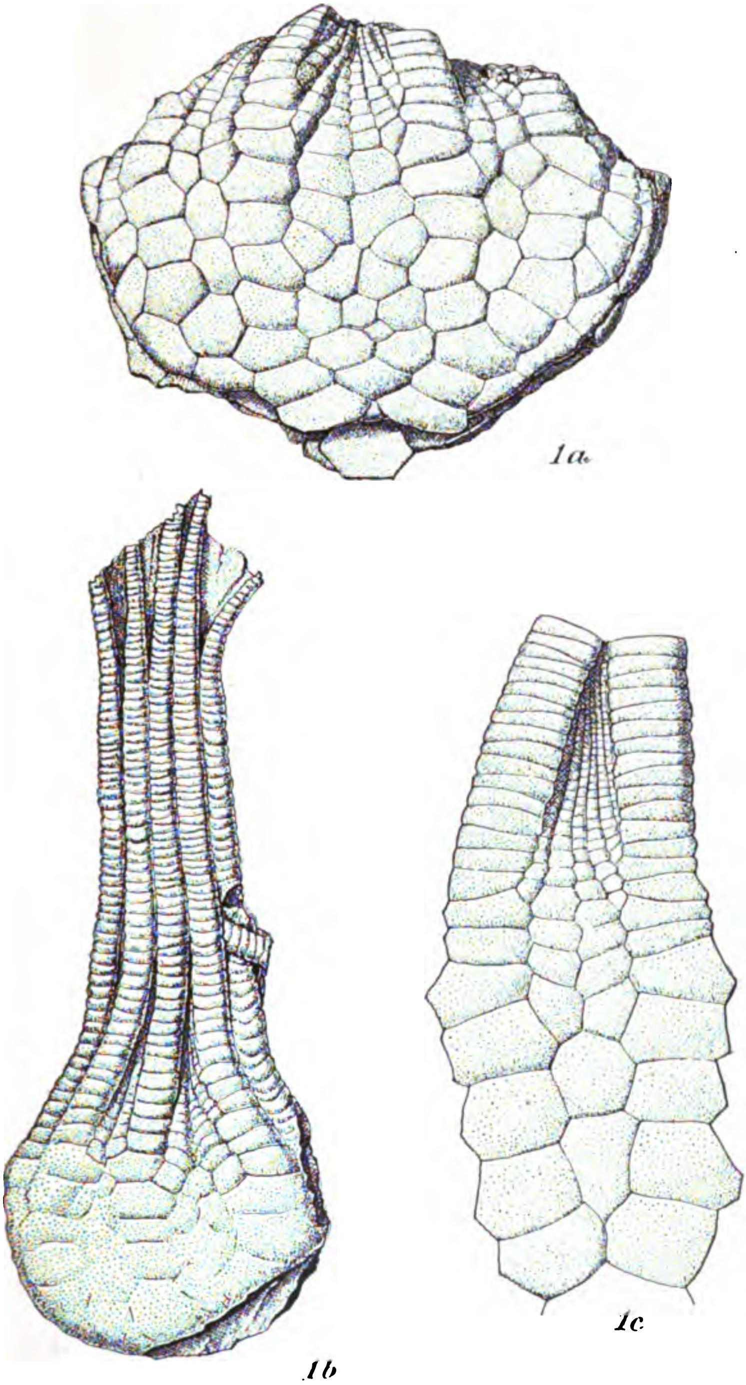
In consequence of a mistake in drawing, the forms the upper and lower views of the tests of the Holasteridæ and Spatangidæ are inverted on the plates.

PLATE I.

PLATE I.

UINTACRINUS SOCIALIS Grinnell (page 21).

Fig. 1*a*. Laterial view of the test, with interradial area central, natural size.
1*b*. Test with arms.
1*c*. A radial area, magnified two diameters.



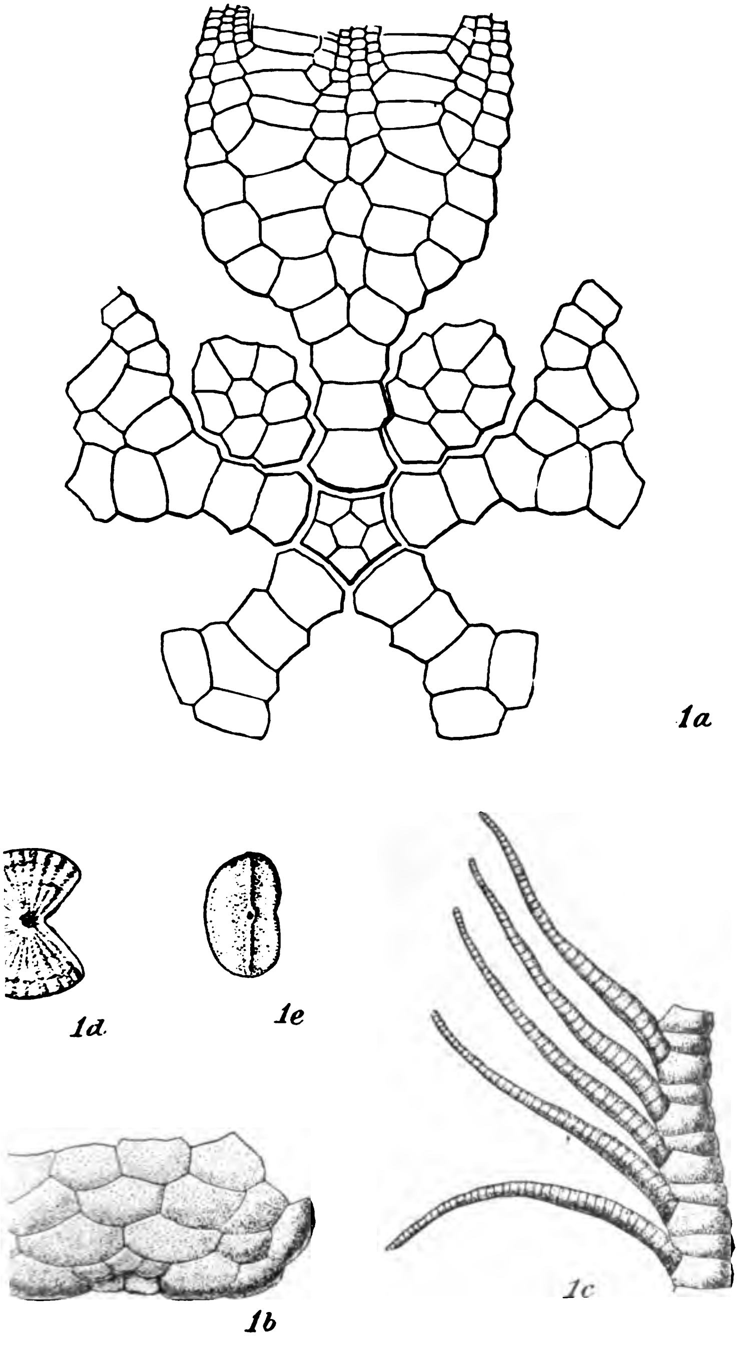
UINTACRINUS.

PLATE II.

PLATE II.

UINTACRINUS SOCIALIS Grinnell (page 21).

Fig. 1*a*. Diagram showing the structural arrangement of the plates in the test.
1*b*. Specimen showing basals and portions of radial and interradial areas.
1*c*. Lateral view of arm with attached pinnules.
1*d*. Zizygial surface of brachial plate.
1*e*. Articular surface of brachial plate.



UINTACRINUS.

PLATE III.

PLATE III.

BOURGUETICRINUS ALABAMENSIS De Loriol (page 25).

Fig. 1*a*. Side view of the basal cone magnified five diameters.
1*b*. Upper surface magnified six diameters.
1*c*. Lower surface magnified six diameters.

PENTACRINUS ASTERISCUS Meek & Hayden (page 26).

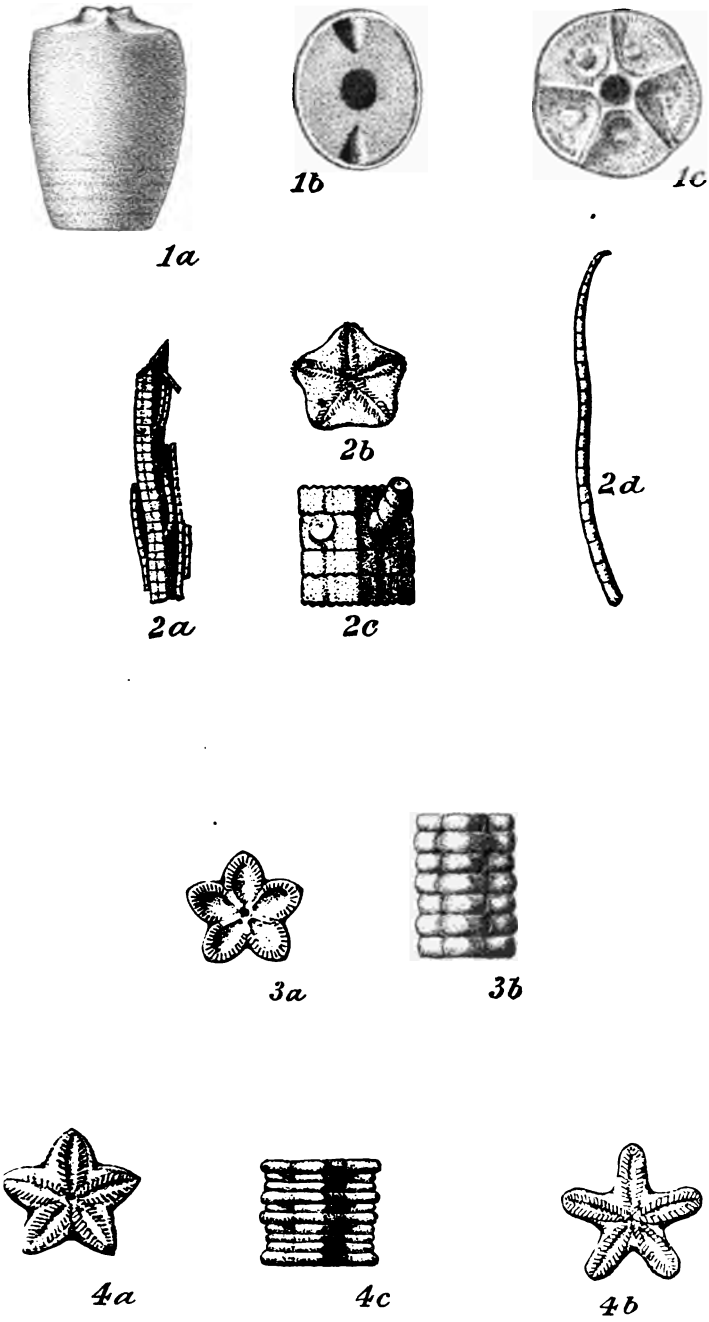
Fig. 2*a*. Column with attached pinnules.
2*b*. Upper surface of a detached plate of the column.
2*c*. Lateral view of a portion of the column.
2*d*. Enlarged pinnule.

PENTACRINUS BRYANI Gabb (page 28).

Fig. 3*a*. Upper surface of a detached plate of the column.
3*b*. Lateral view of a portion of the column.

PENTACRINUS WHITEI Clark (page 27).

Fig. 4*a*. Upper surface of a detached plate of the column.
4*b*. Ditto.
4*c*. Lateral view of a portion of the column.



BOURGUETICRINUS AND PENTACRINUS.

PLATE IV.

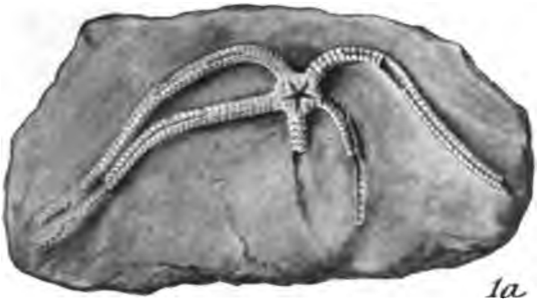
PLATE IV.

OPHIOGLYPHA BRIDGERENSIS (Meek) (page 29)

Fig. 1*a*. Skeleton, natural size.
  1*b*. Enlarged view of a portion of the upper surface.
  1*c*. Enlarged view of a portion of the lower surface.

OPHIOGLYPHA TEXANA Clark (page 30).

Fig. 2*a*. Skeleton.
  2*b*. Enlarged view of a portion of the upper surface.



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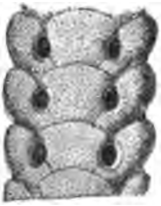

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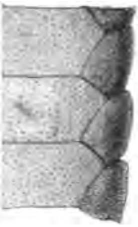

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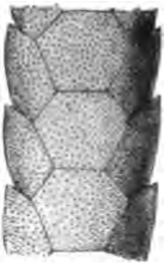

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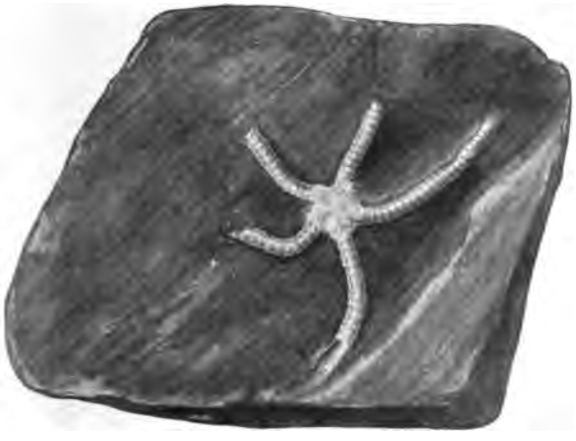


2a

OPHIOGLYPHA.

PLATE V.

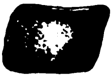
PLATE V.

GONIASTER MAMMILLATA Gabb (page 32).

Fig. 1*a*–*g*. Views from various sides of four different plates; magnified two diameters.
1*h*. Greatly magnified surface of plate.

ASTERIAS DUBIUM Whitfield (page 31).

Fig. 2. Gutta-percha cast of three individuals.



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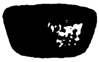

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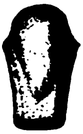

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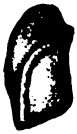

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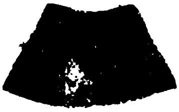

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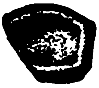

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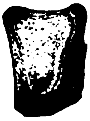

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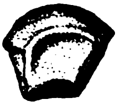
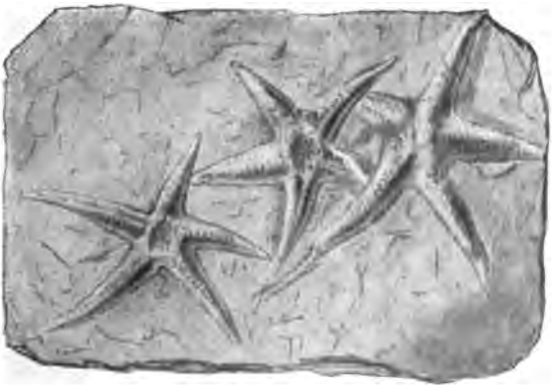


1g



2

GONIASTER AND ASTERIAS.

PLATE VI.

PLATE VI.

[illegible] CALIFORNIENSIS Clark (page 36).

Fig. 1a. Same, enlarged. [illegible]

1b. Same.

1c. Anterior surface [illegible] much enlarged.

[illegible] TAYLORENSIS Clark (page 35).

Fig. 3a. Fragment of [illegible] interambulacral plates of the same ser

3b. Same.

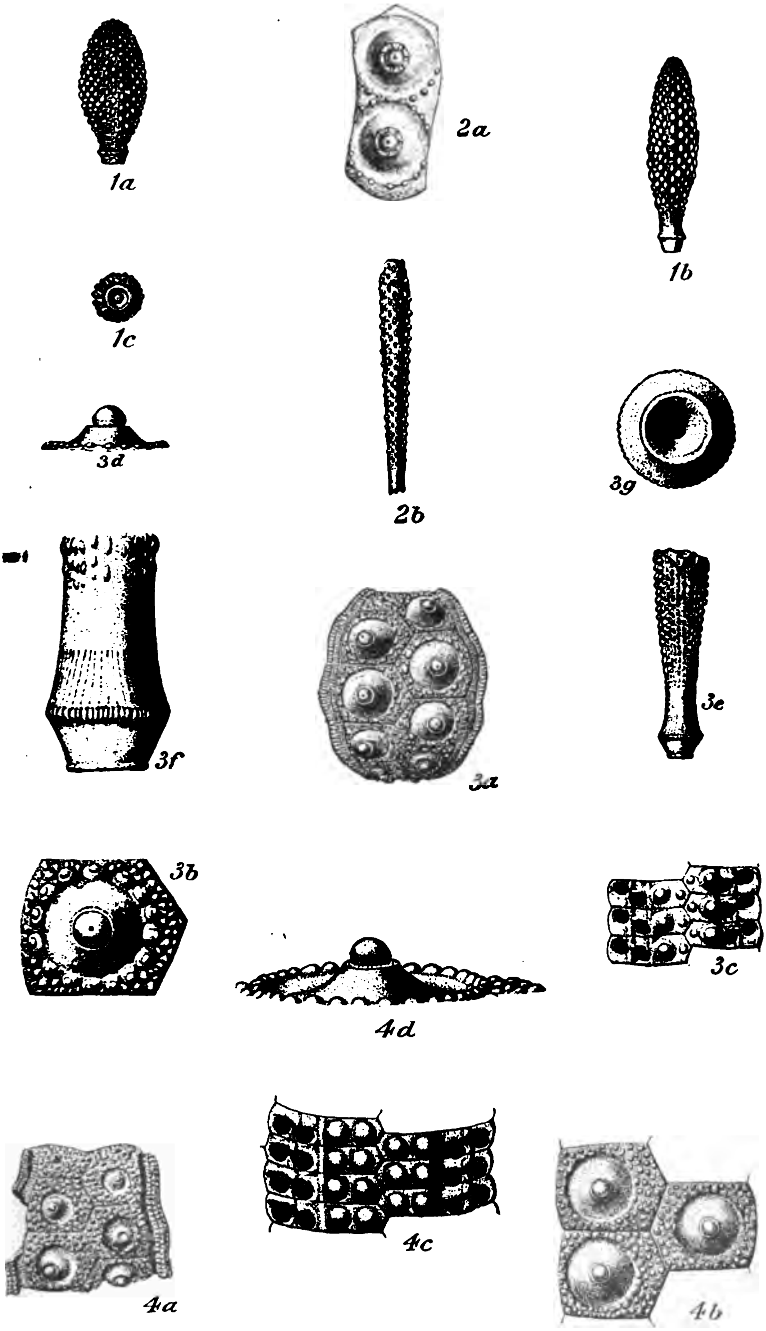
[illegible] PLANATUS Morton (page 33).

[illegible] two diameters.

[illegible]

[illegible] Clark (page 37).

[illegible]



CIDARIS.

PLATE VI.

Cidaris californicus Clark (page 36).

Fig. 1*a*. Spine, enlarged.
1*b*. Ditto.
1*c*. Articular surface of 1*b*, much enlarged.

Cidaris taylorensis Clark (page 35).

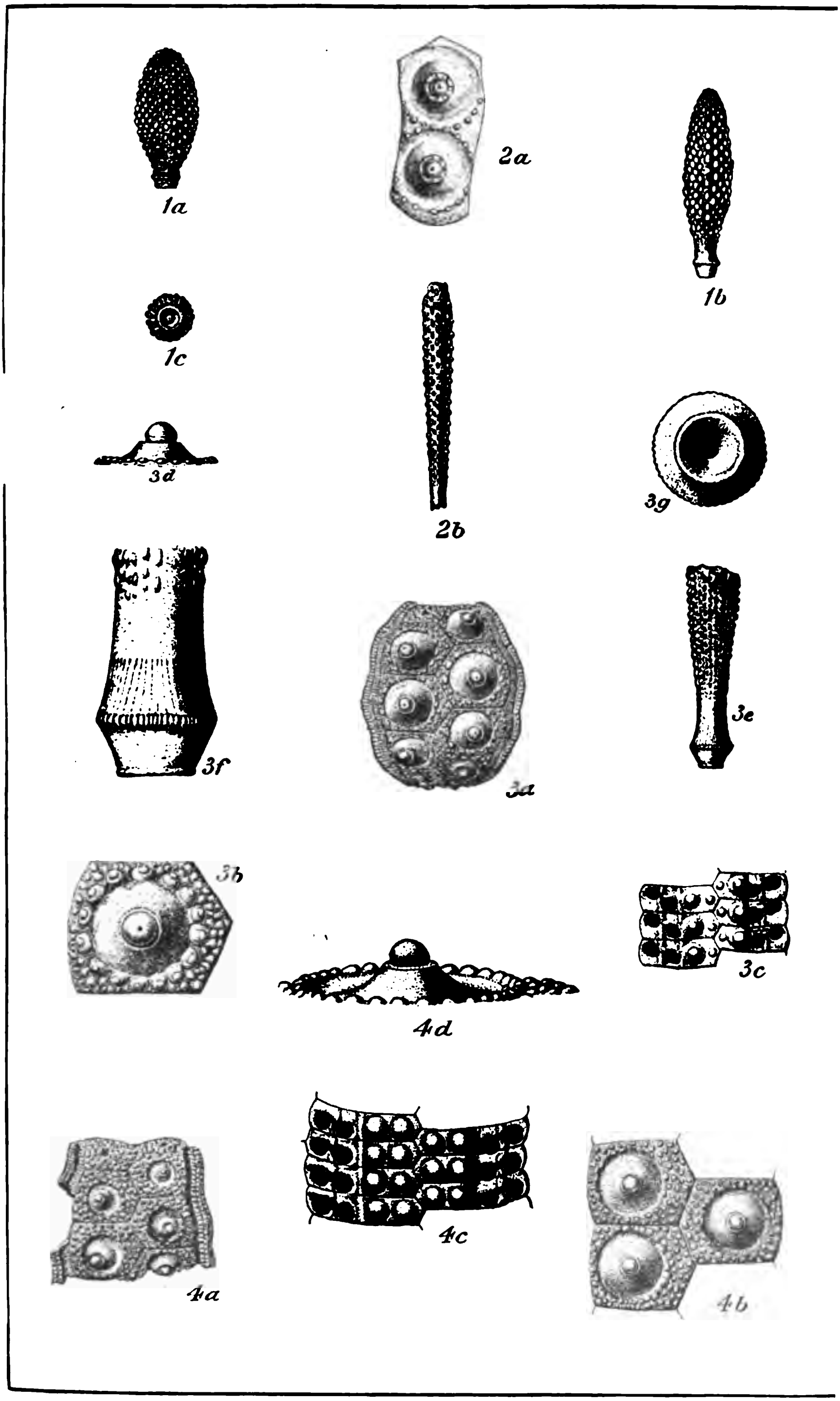
Fig. 2*a*. Fragment of two contiguous interambulacral plates of the same series.
2*b*. Spine.

Cidaris splendens Morton (page 33).

Fig. 3*a*. Portion of test, natural size.
3*b*. Interambulacral plate, magnified two diameters.
3*c*. Ambulacral area, highly magnified.
3*d*. Tubercle, enlarged.
3*e*. Spine.
3*f*. Base of same much enlarged.
3*g*. Articular surface of spine.

Cidaris Walcotti Clark (page 37).

Fig. 4*a*. Portion of test, natural size.
4*b*. Interambulacral plates, enlarged.
4*c*. Ambulacral area, highly magnified.
4*d*. Tubercle, enlarged.



CIDARIS.

PLATE VII.

PLATE VII.

Cidaris texanus Clark (page 36).

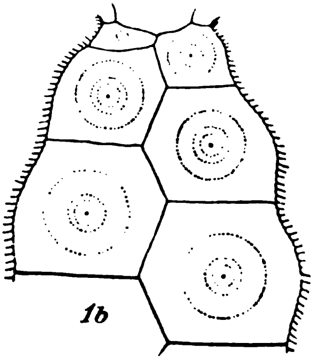
Fig. 1*a*. Test restored, natural size.
1*b*. View showing the arrangement of the interambulacral plates in the vicinity of the apical disk, with adjacent ambulacral plates.
1*c*. Portion of ambulacral area, enlarged.
1*d*. Interambulacral plate, enlarged.
1*e*. Tubercle, much enlarged.

Leiocidaris hemigranosus (Shumard) (page 38).

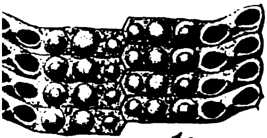
Fig. 2*a*. Interambulacral plate.
2*b*. Portion of ambulacral area, enlarged.
2*c*. Tubercles, magnified two diameters.
2*d*. Apical disk, enlarged.

1d

1e



1b



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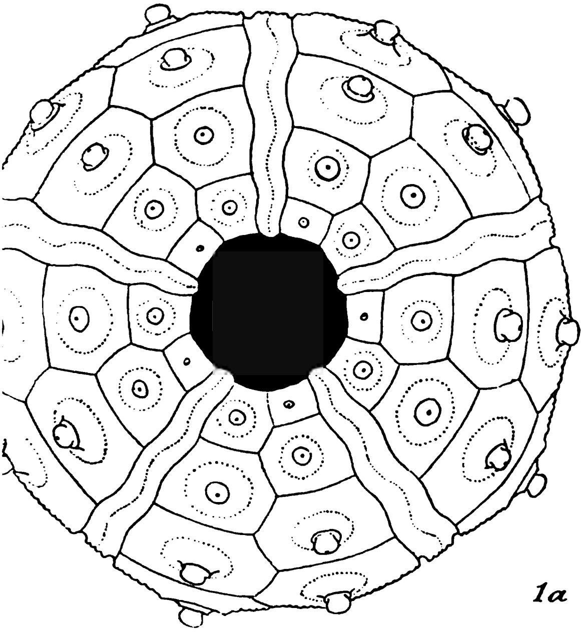

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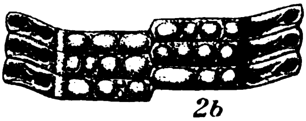
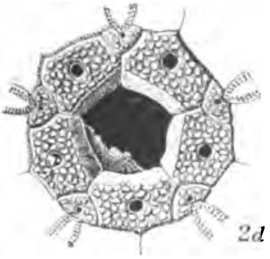


2b

a

2c



2d

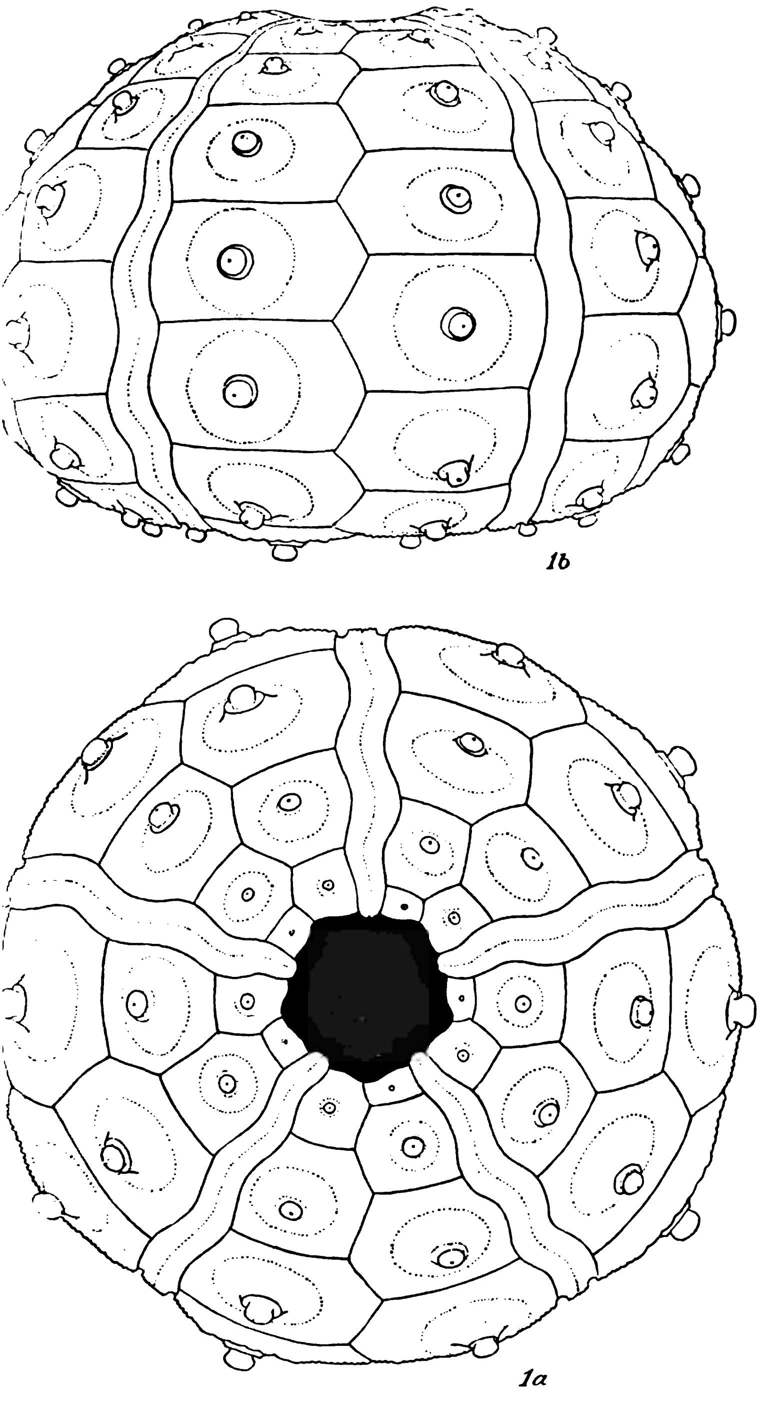
CIDARIS AND LEIOCIDARIS.

PLATE VIII.

PLATE VIII.

Leiocidaris hemigranosus (Shumard) (page 38).

Fig. 1*a*. Upper surface of the test, natural size.
1*b*. Lateral view of the same.



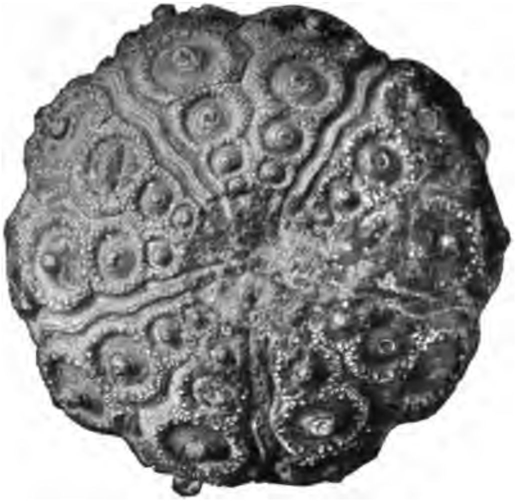
LEIOCIDARIS.

PLATE IX.

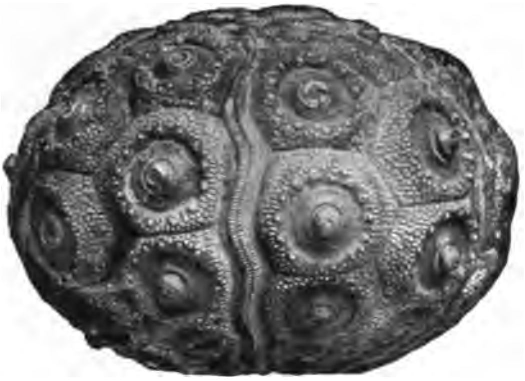
PLATE IX.

LEIOCIDARIS HEMIGRANOSUS (Shumard) (page 38).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.



1b



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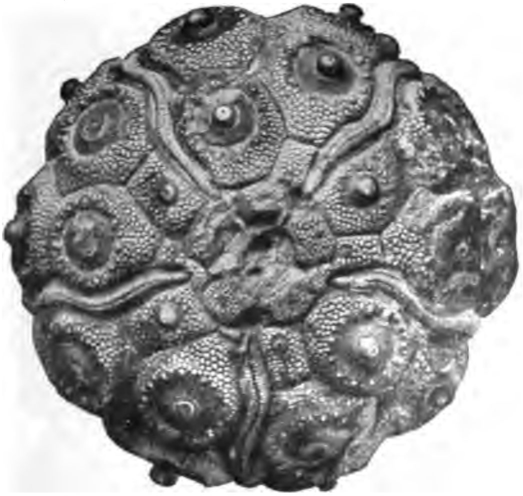


1a

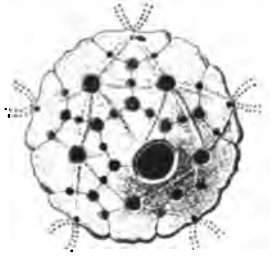
LEIOCIDARIS.

PLATE X.

PLATE X.

Salenia texana Credner (page 40).

Fig. 1*a*. Upper surface of the test, natural size.
1*b*. Under surface of the same.
1*c*. Lateral surface of the same.
1*d*. Interambulacral area, magnified two diameters.
1*e*. Ambulacral area, magnified three diameters.
1*f*. Portion of the same, highly magnified.
1*g*. Apical disk, enlarged.
1*h*. Tubercle, enlarged.



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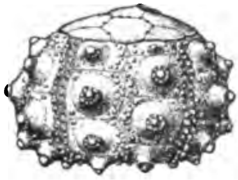

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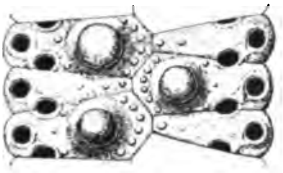

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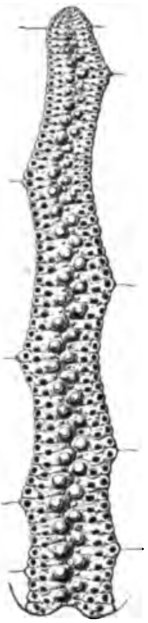

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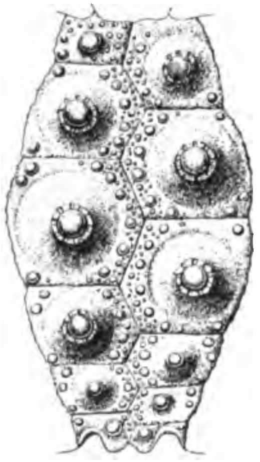

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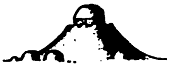

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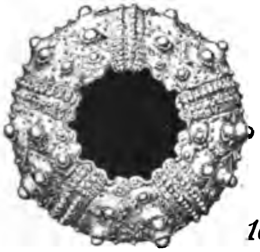

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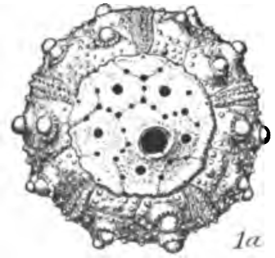


1a

SALENIA.

PLATE XI.

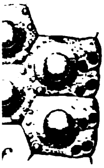
PLATE XI.

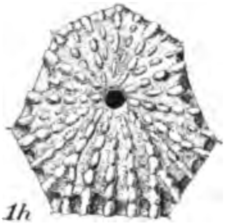
SALENIA TUMIDULA Clark (page 41).

Fig. 1*a*. Upper surface of test, magnified two diameters.
1*b*. Under surface of the same.
1*c*. Lateral surface of the same.
1*d*. Interambulacral area, magnified four diameters.
1*e*. Single plate of same, highly magnified.
1*f*. Ambulacral area, highly magnified.
1*g*. Apical disk, enlarged.
1*h*. Genital plate of same, highly magnified.
1*i*. Mouth opening, enlarged.
1*j*. Tubercle, enlarged.

SALENIA BELLULA Clark (page 43).

Fig. 2*a*. Upper surface of test, magnified two diameters.
2*b*. Under surface of the same.
2*c*. Lateral surface of the same.
2*d*. Three interambulacral plates, highly magnified.
2*e*. Three ambulacral plates, highly magnified.
2*f*. Apical disk, enlarged.
2*g*. Tubercle, highly magnified.

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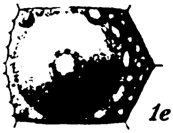
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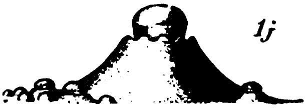
1g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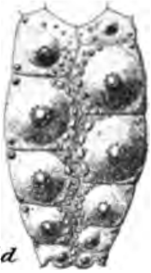
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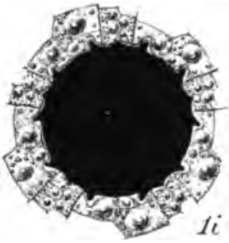
1a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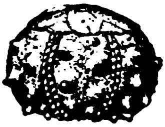
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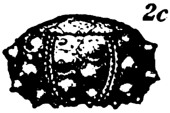
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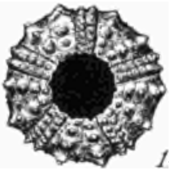
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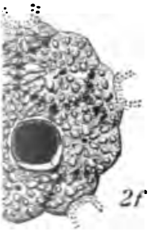
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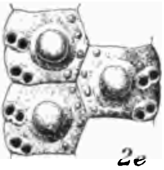
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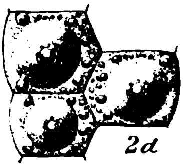
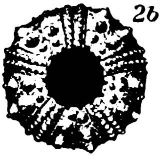

2d

2a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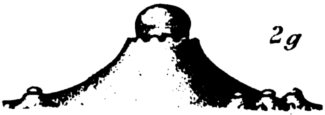

2g

SALENIA.

PLATE XII.

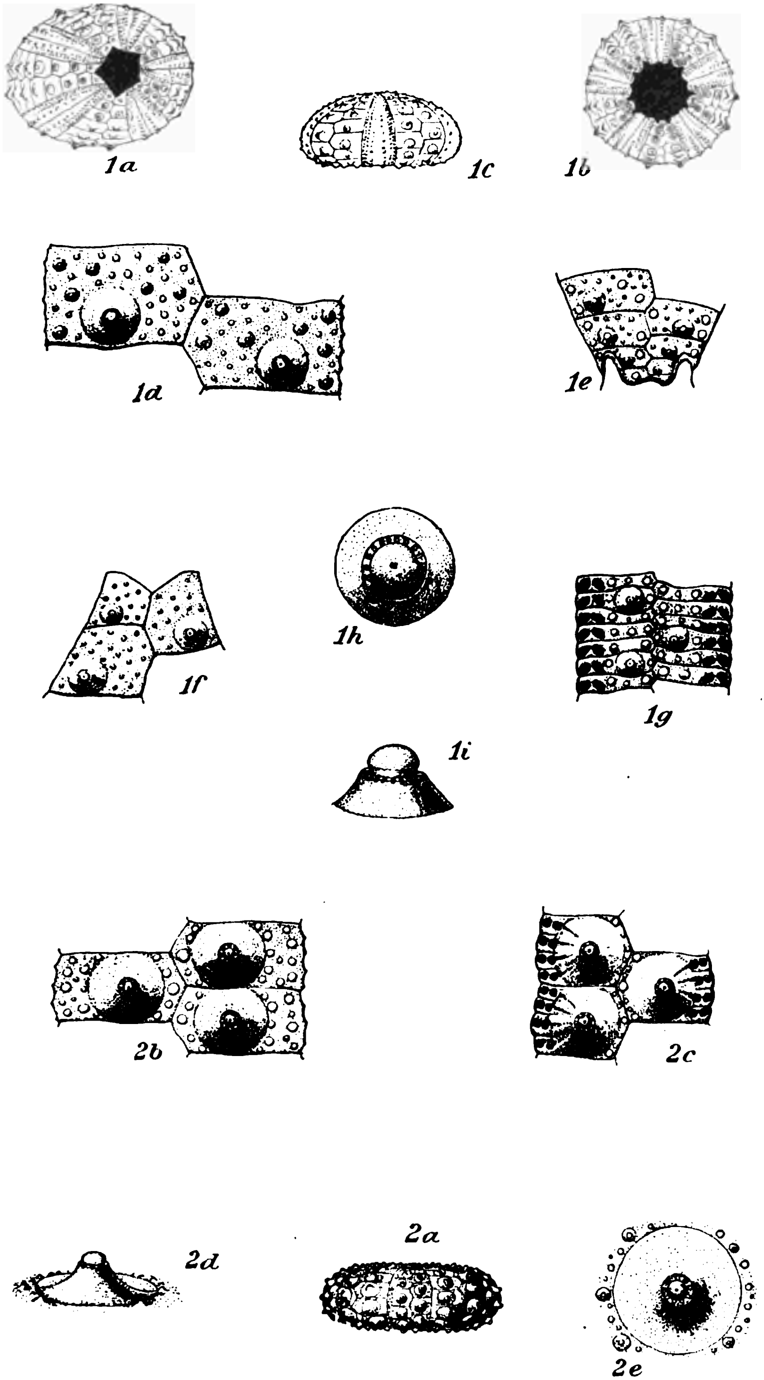
PLATE XII.

HEMICIDARIS INTUMESCENS Clark (page 44).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Two interambulacral plates, highly magnified.
1*e*. Lower portion of interambulacral area, enlarged.
1*f*. Upper portion of same.
1*g*. Portion of ambulacral area, magnified.
1*h*. Tubercle, from above.
1*i*. Lateral view of the same.

PSEUDODIADEMA EMERSONI Clark (page 45.

Fig. 2*a*. Lateral view of the test.
2*b*. Portion of the interambulacral area, enlarged.
2*c*. Portion of the ambulacral area, enlarged.
2*d*. Tubercle, from the side.
2*e*. The same, from above,



HEMICIDARIS AND PSEUDODIADEMA.

PLATE XIII.

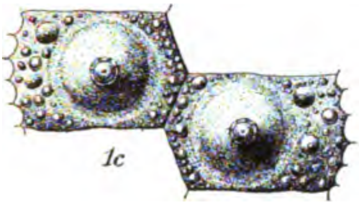
PLATE XIII.

PSEUDODIADEMA DIATRETUM (Morton) (page 46).

Fig. 1*a*. Under surface of test.
1*b*. Lateral view of the same.
1*c*. Two interambulacral plates, magnified four diameters.
1*d*. Ambulacral plates, highly magnified.
1*e*. Ditto.
1*f*. Tubercle, much enlarged.

PSEUDODIADEMA TEXANUM (Roemer) (page 47).

Fig. 2*a*. Upper portion of the interambulacral area, highly magnified.
2*b*. Portion of ambulacral area, ditto.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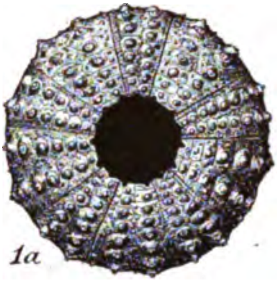
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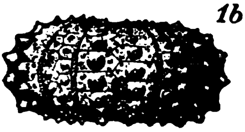
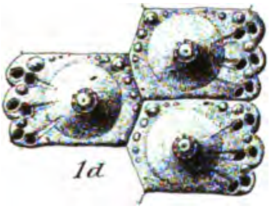

1b

1f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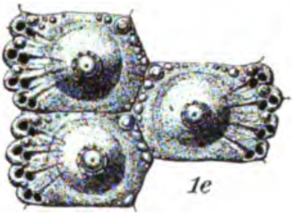
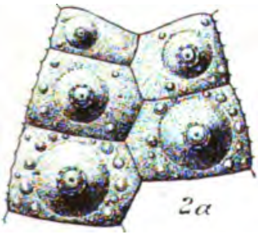

1e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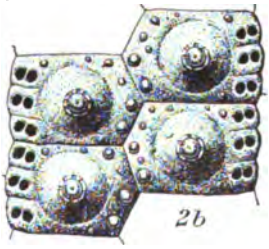

2b

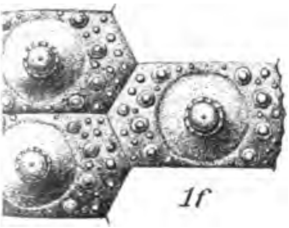
PSEUDODIADEMA.

PLATE XIV

PLATE XIV.

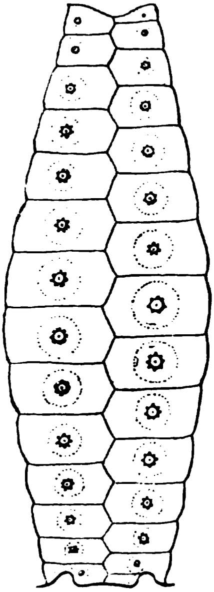
Pseudodiadema texanum (Roemer) (page 47).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. Lateral surface of the same.
1*d*. Interambulacral area, enlarged.
1*e*. Ambulacral area, enlarged.
1*f*. Three interambulacral plates, highly magnified.
1*g*. Tubercle, much enlarged.


1f

1c

1g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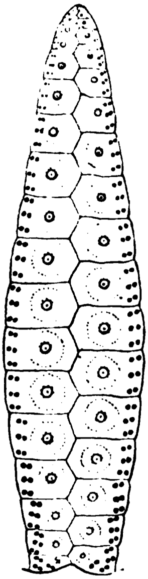
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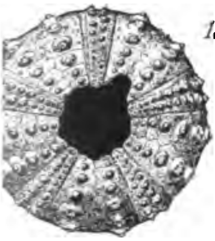
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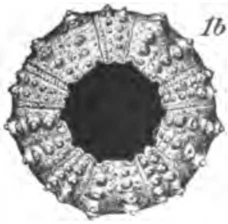

1b

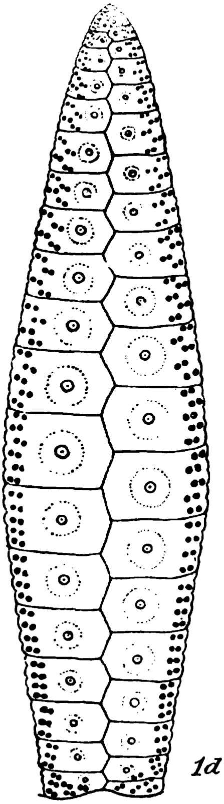
PSEUDODIADEMA.

PLATE XV.

PLATE XV.

DIPLOPODIA TEXANUM (Roemer) (page 48).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. Lateral surface of the same.
1*d*. Ambulacral area, enlarged.
1*e*. Four plates of the same, highly magnified.
1*f*. Interambulacral plates, ditto.



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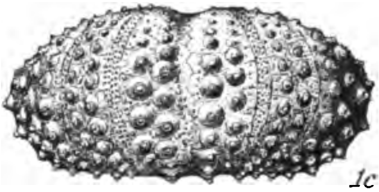

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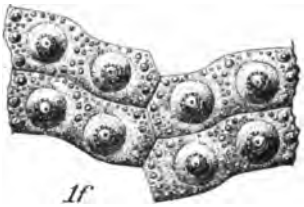

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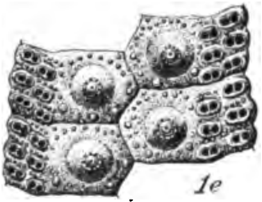
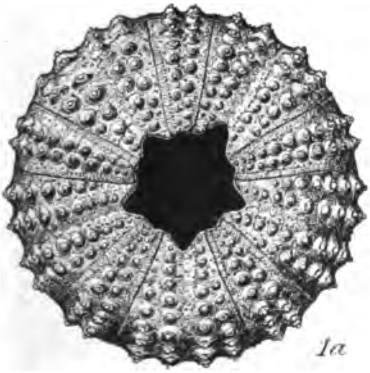
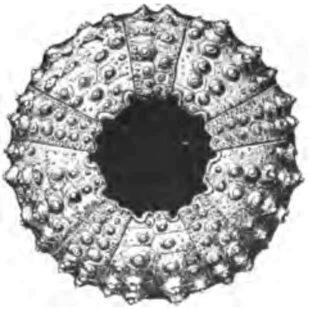


1e



1a



1b

DIPLOPODIA.

PLATE XVI.

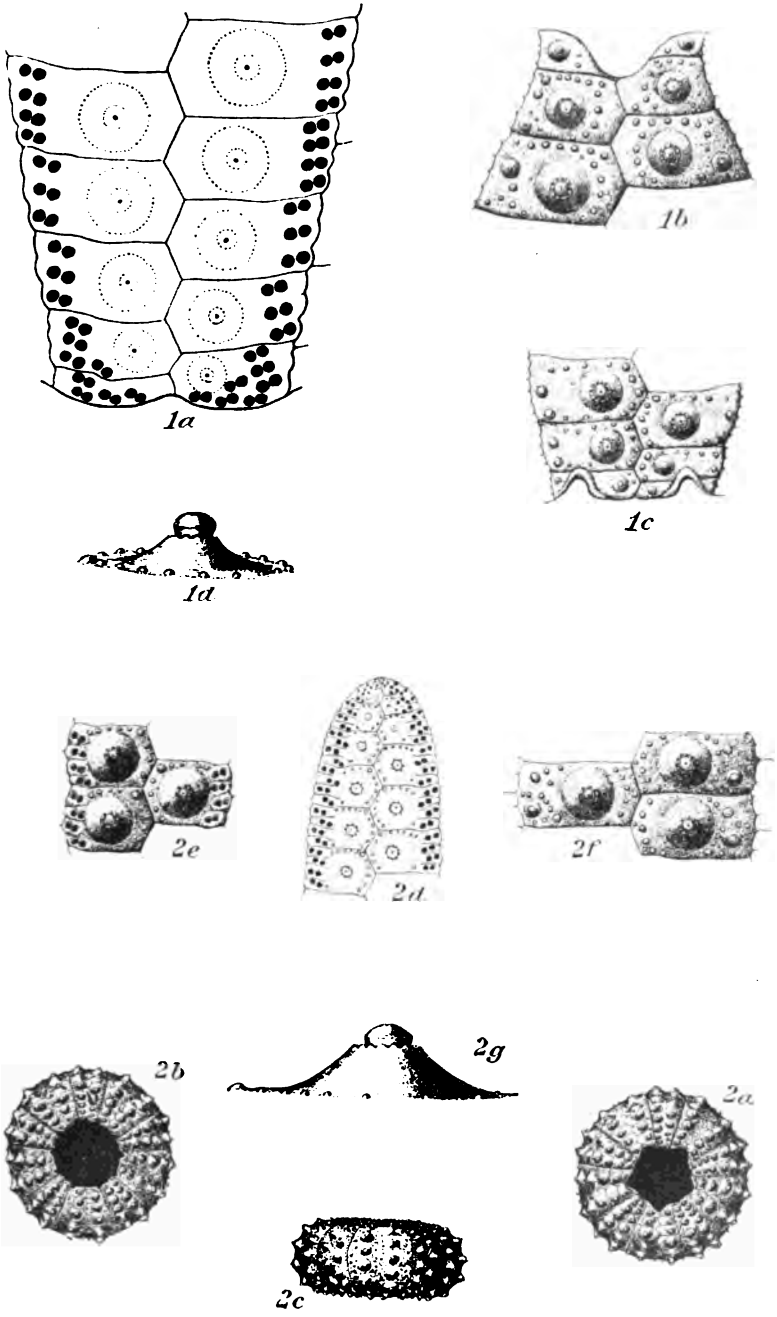
PLATE XVI.

DIPLOPODIA TEXANUM (Roemer) (page 48).

Fig. 1*a*. Lower portion of ambulacral area, highly magnified.
1*b*. Upper portion of interambulacral area, much enlarged.
1*c*. Lower portion of same, ditto.
1*d*. Tubercle.

DIPLOPODIA HILLI Clark (page 50).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the same.
2*c*. Lateral surface of the same.
2*d*. Upper portion of an ambulacral area, enlarged.
2*e*. Three plates of the same, highly magnified.
2*f*. A portion of an interambulacral area, highly magnified.
2*g*. Tubercle.



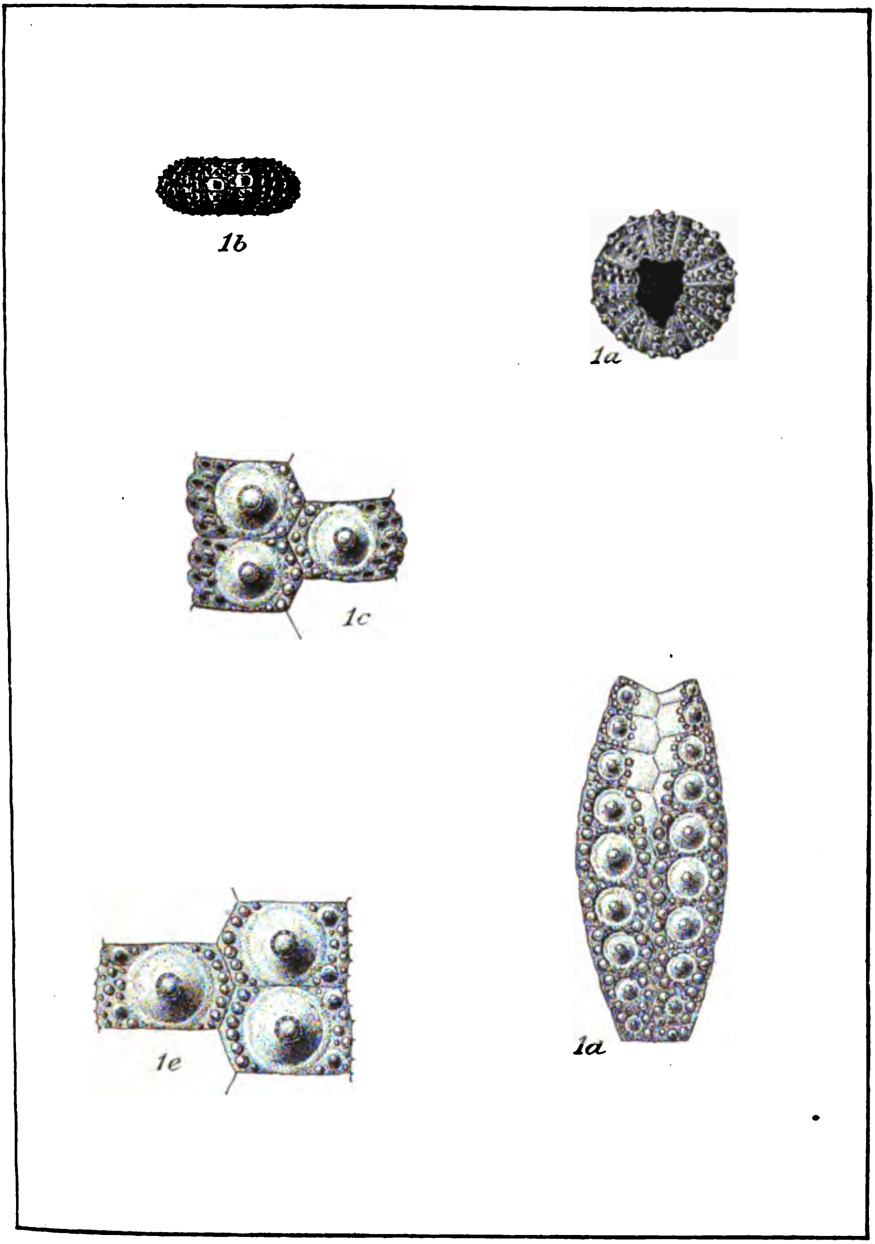
DIPLOPODIA.

PLATE XVII.

PLATE XVII.

COPTOSOMA MORTONI (de Loriol) (page 51).

Fig. 1*a*. Upper surface of the test.
1*b*. Lateral view of the same.
1*c*. Three ambulacral plates, much enlarged.
1*d*. Interambulacral area, enlarged.
1*e*. Three interambulacral plates, much enlarged.



COPTOSOMA.

PLATE XVIII.

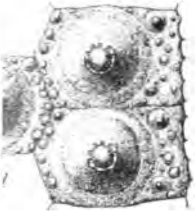
PLATE XVIII.

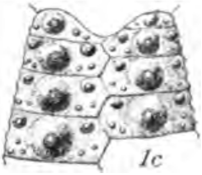
Coptosoma speciosum **Clark (page 52).**

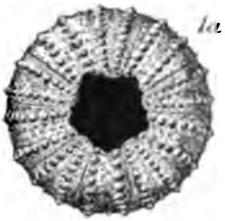
Fig. 1*a*. Upper surface of the test.
1*b*. Lateral view of the same.
1*c*. Upper portion of an interambulacral area, enlarged.
1*d*. Three plates of the same, highly magnified.
1*e*. Portion of ambulacral area, highly magnified.
1*f*. Ditto.
1*g*. Tubercle of ambulacral area.
1*h*. Tubercle of interambulacral area.

Goniopygus Zitteli **Clark (page 53).**

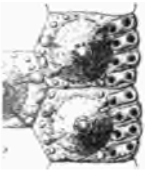
Fig. 2*a*. Lateral surface of the test.
2*b*. Lower portion of ambulacral area, highly magnified.
2*c*. Portion of interambulacral area, highly magnified.
2*d*. Apical disk, enlarged.

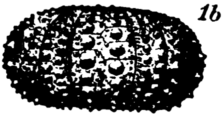


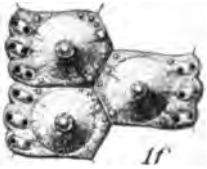

1c


1a

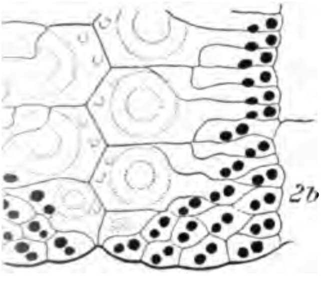
1g




1b


1f

1h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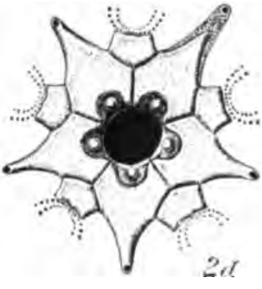
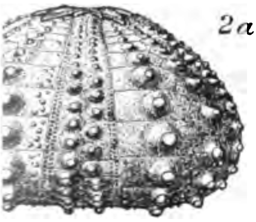
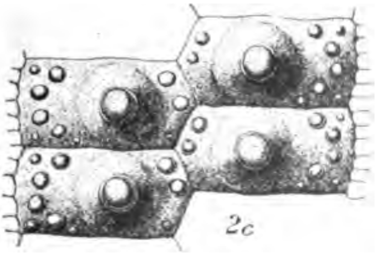

2d


2a


2c

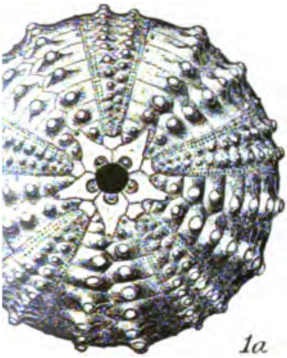
COPTOSOMA AND GONIOPYGUS.

PLATE XIX.

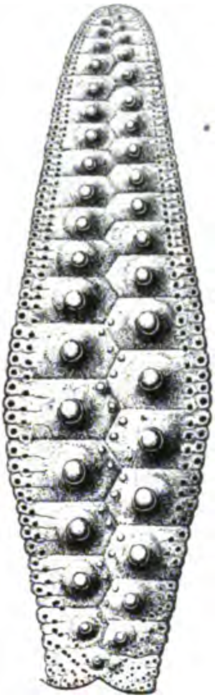
PLATE XIX.

GONIOPYGUS ZITTELI Clark (page 53)

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. Interambulacral area, enlarged.
1*d*. Ambulacral area, enlarged.
1*e*. Tubercle.



1a



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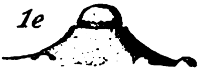

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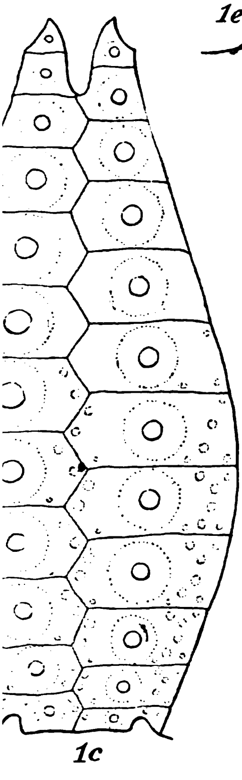

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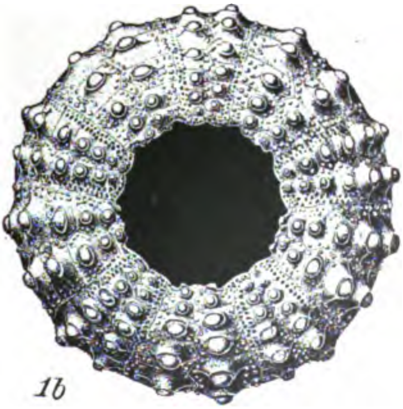


1b

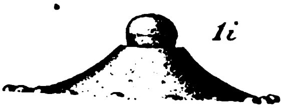
GONIOPYGUS.

PLATE XX.

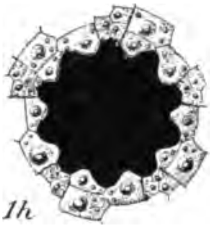
PLATE XX.

PSAMMECHINUS CINGULATUS Clark (page 55).

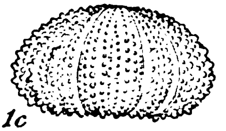
Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Interambulacral area, enlarged.
1*e*. Three plates of the same, highly magnified.
1*f*. Ambulacral area, enlarged.
1*g*. Four plates of the same, highly magnified.
1*h*. Mouth opening, enlarged.
1*i*. Tubercle.



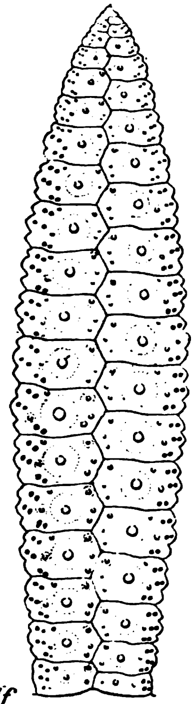
1i



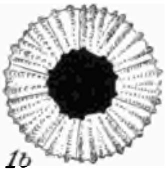
1h



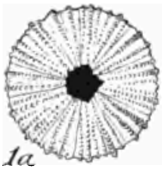
1c



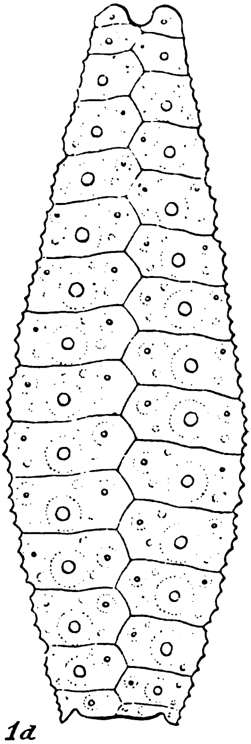
1f



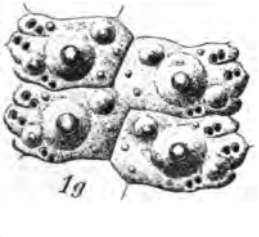
1b



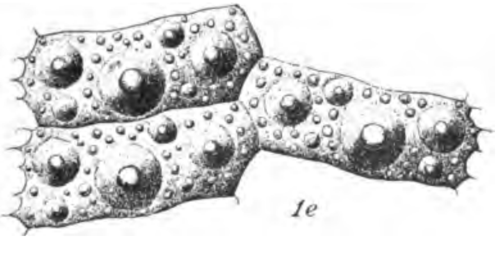
1a



1d



1g



1e

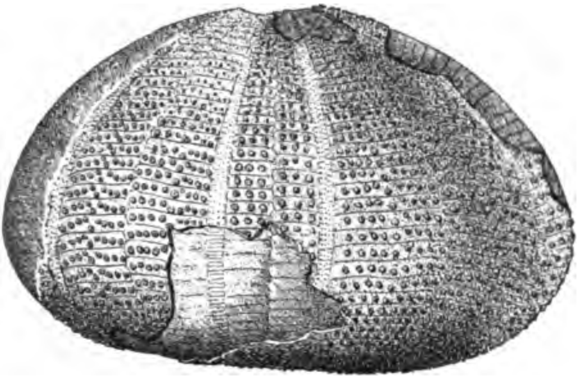
PSAMMECHINUS.

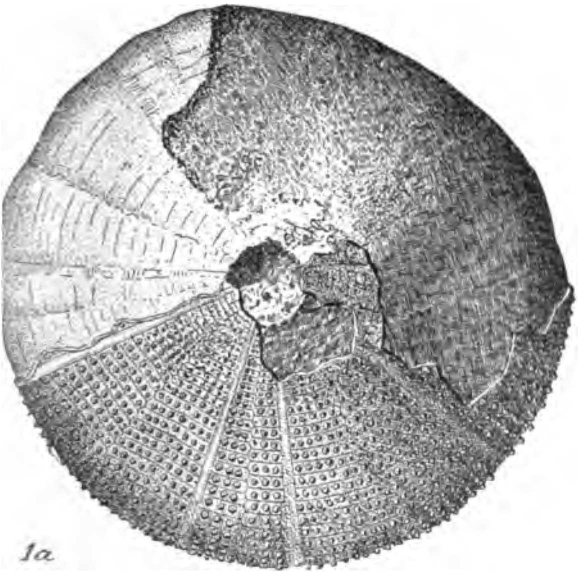
PLATE XXI.

PLATE XXI.

PEDINOPSIS PONDI Clark (page 57).

Fig. 1*a*. Upper surface of the test.
1*b*. Lateral view of the same.





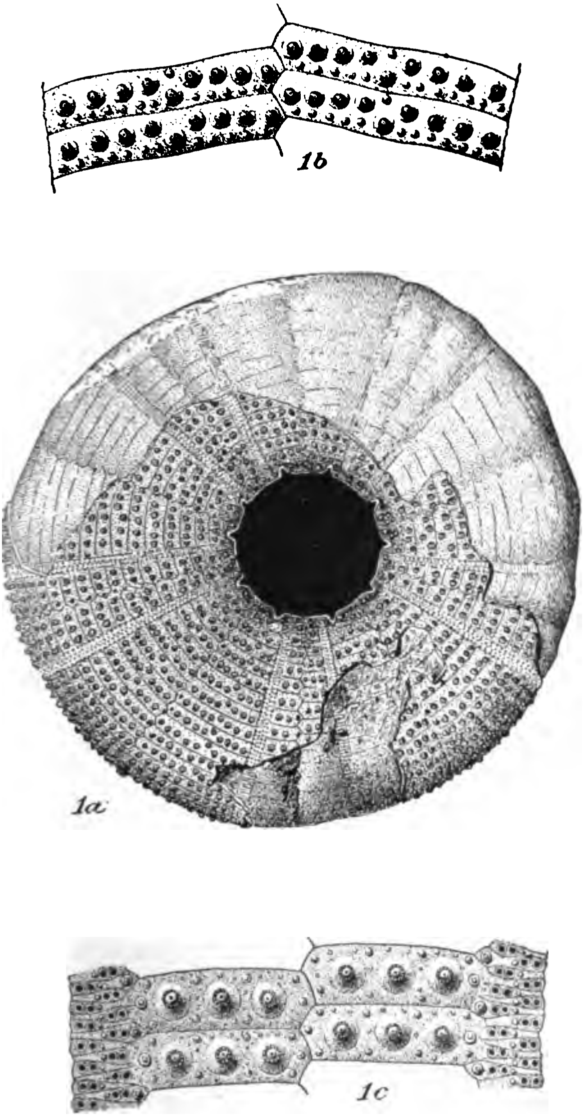
PEDINOPSIS.

PLATE XXII.

PLATE XXII.

PEDINOPSIS PONDI Clark (page 57).

Fig. 1*a*. Lower surface of the test.
1*b*. Four interambulacral plates, much enlarged.
1*c*. Four ambulacral plates, highly magnified.



PEDINOPSIS.

PLATE XXIII.

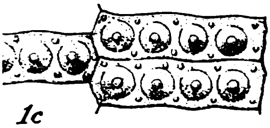
PLATE XXIII.

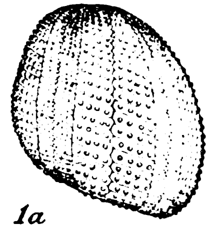
STOMECHINUS HYATTI Clark (page 56).

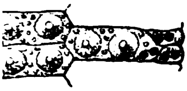
Fig. 1*a*. Lateral surface view of the test, slightly distorted.
1*b*. Portion of the ambulacral area, enlarged.
1*c*. Portion of the interambulacral area, enlarged.
1*d*. Tubercle from above, highly magnified.
1*e*. The same from the side.

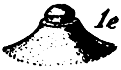
HOLECTYPUS PLANATUS Roemer (page 58).

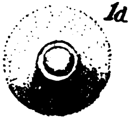
Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the same.
2*c*. Lateral surface of the same.
2*d*. Two interambulacral plates, enlarged.
2*e*. Portion of the ambulacral area, highly magnified.
2*f*. Apical disk, enlarged.

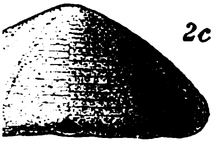

1c

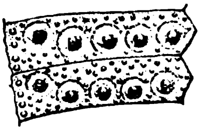

1a

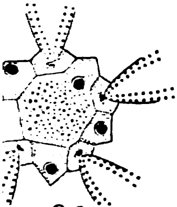

1b

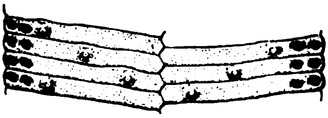

1e

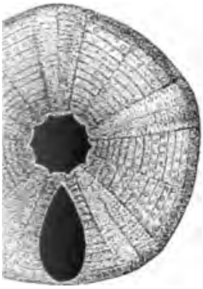

1d

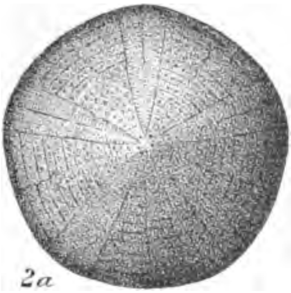

2c


2 d


2f


2e




2a

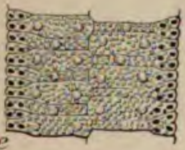
STOMECHINUS AND HOLECTYPUS.

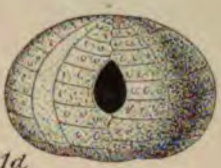
PLATE XXIV.

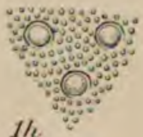
PLATE XXIV.

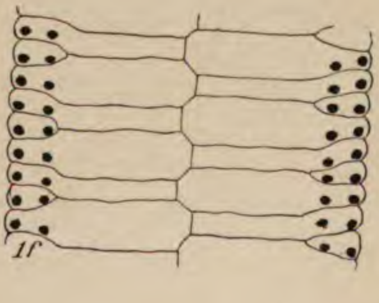
PYRINA PARRYI Hall (page 59).

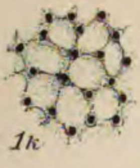
Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. Side view of the same.
1*d*. Posterior view of the same.
1*e*. Portion of an ambulacral area, enlarged.
1*f*. The same further enlarged.
1*g*. Two interambulacral plates, magnified three diameters.
1*h*. Portion of single interambulacral plate, highly magnified.
1*i*. Apical disk, enlarged.
1*k*. Portion of the madreporite, highly magnified.

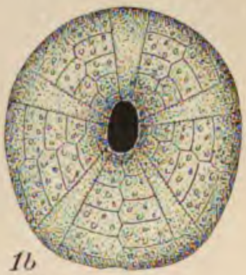

1e


1d


1h


1f


1k


1b

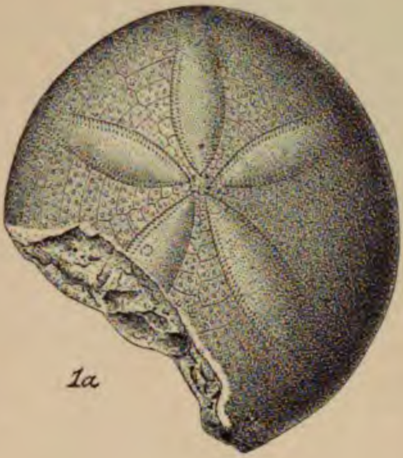
PYRINA.

PLATE XXV.

PLATE XXV.

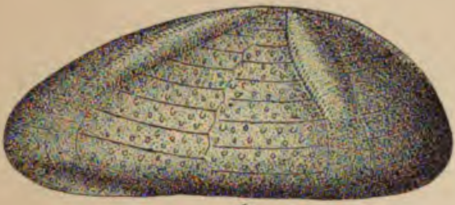
BOTRIOPYGUS ALABAMENSIS Clark (page 60).

Fig. 1*a*. Upper surface of test.
1*b*. Lower surface of test.
1*c*. Side view of the same.
1*d*. Portion of an ambulacral area at base of petaloidal region, enlarged.
1*e*. Same in center of petaloidal region, highly magnified.
1*f*. An interambulacral plate, highly magnified.

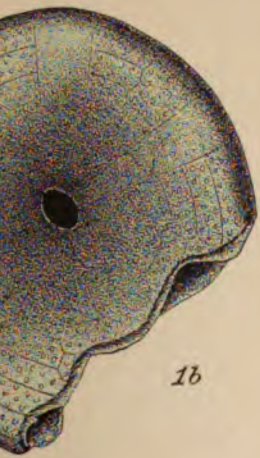


1a

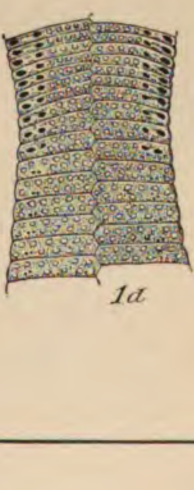
e



1c



1b



1d

BOTRIOPYGUS.

PLATE XXVI.

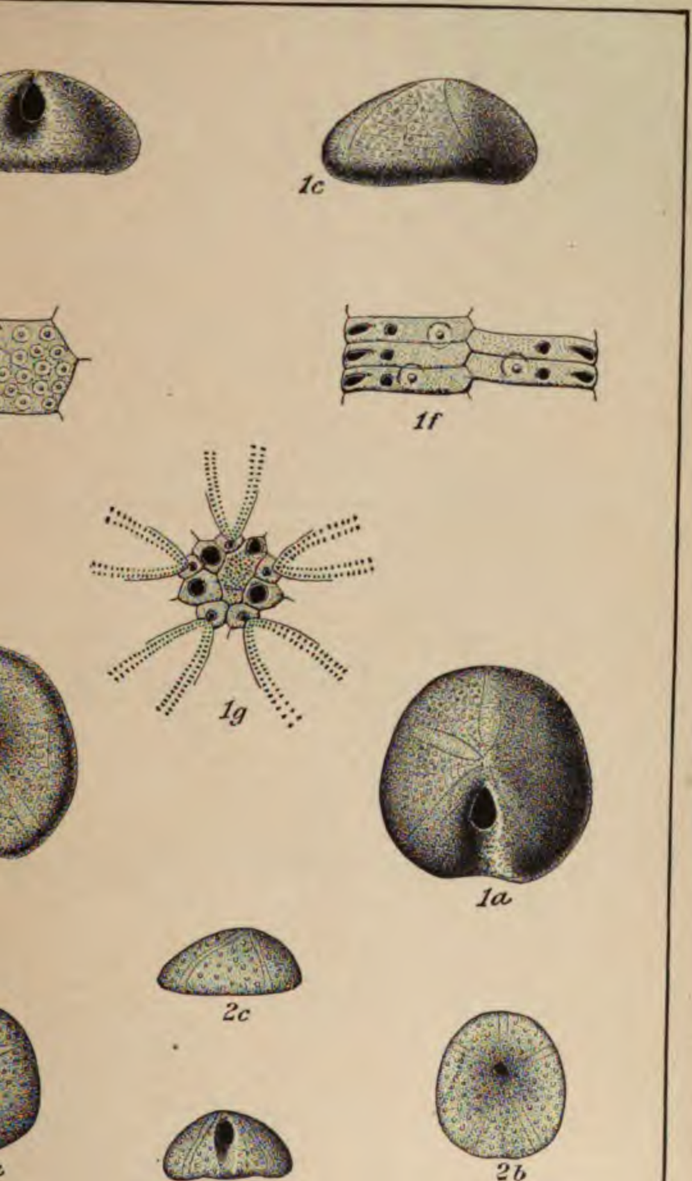
PLATE XXVI.

ECHINOBRISSUS EXPANSUS Clark (page 61).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Side view of the same.
1*d*. Posterior view, showing anal sulcus.
1*e*. An interambulacral plate, enlarged.
1*f*. Portion of the petaloidal region of the right antero-lateral ambulacral area.
1*g*. Apical disk, enlarged.

ECHINOBRISSUS TEXANUS Clark (page 62).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the test.
2*c*. Side view of the same.
2*d*. Posterior view, showing anal sulcus.
2*e*. Portion of the right antero-lateral ambulacrum.
2*f*. Four interambulacral plates, highly magnified.



ECHINOBRISSUS.

PLATE XXVII.

PLATE XXVII.

TREMATOPYGUS CRUCIFER (Morton) (page 63).

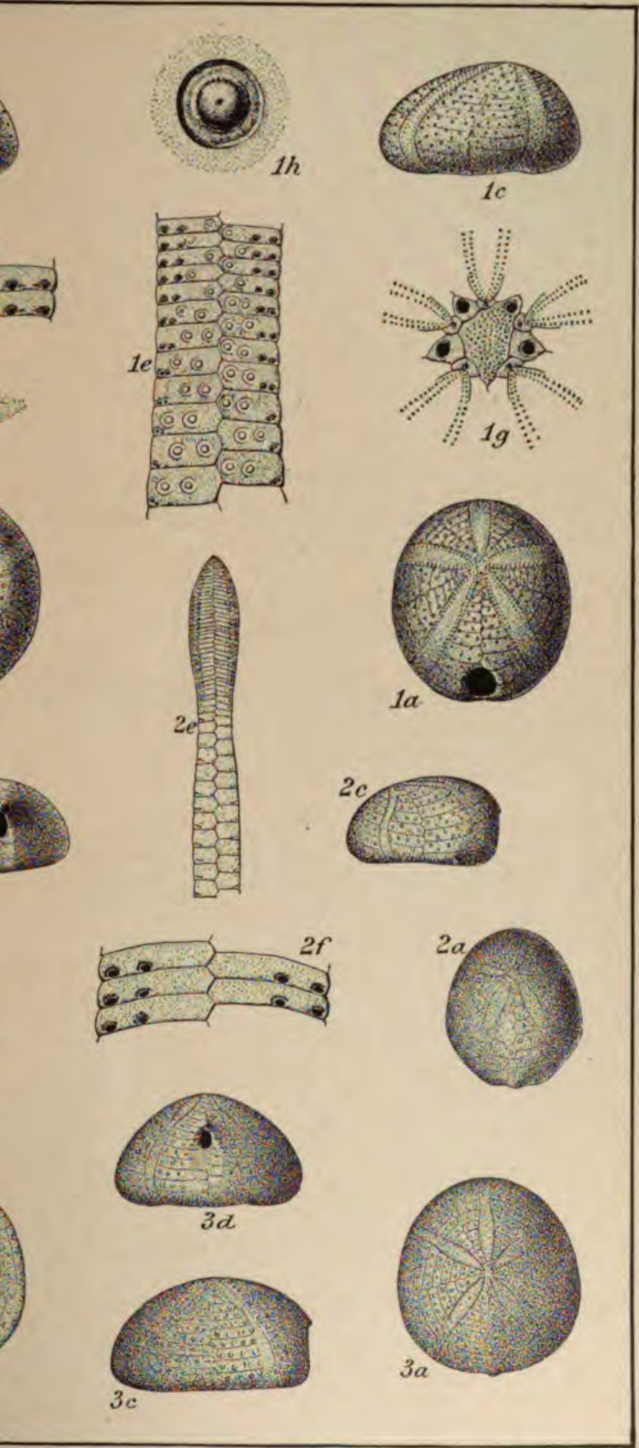
Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Side view of the same.
1*d*. Posterior view of the same.
1*e*. Lower portion of the petaloidal region of the right postero-lateral ambulacrum.
1*f*. Much enlarged view of several plates of the same.
1*g*. Apical disk, enlarged.
1*h*. Tubercle from above.
1*i*. Lateral view of the same.

CATOPYGUS OVIFORMIS Conrad (page 64).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the test.
2*c*. Lateral view of the same.
2*d*. Posterior view of the same.
2*e*. Right postero-lateral ambulacrum, enlarged.
2*f*. Several plates of the same, highly magnified.

CATOPYGUS PUSILLUS Clark (page 65).

Fig. 3*a*. Upper surface of the test.
3*b*. Lower surface of the test.
3*c*. Lateral view of the same.
3*d*. Posterior view of the same.



TREMATOPYGUS AND CATOPYGUS.

PLATE XXVIII.

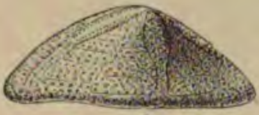
CASSIDULUS FLOREALIS (Morton) (page 66).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Right postero-lateral ambulacrum.
1*f*. Several plates in the petaloidal region of the same, much enlarged.
1*g*. Ditto, lower surface.
1*h*. Posterior interambulacrum.
1*i*. Single plate, much enlarged.
1*j*. Apical disk, highly magnified.
1*k*. Tubercle from above.
1*l*. Lateral view of the same.

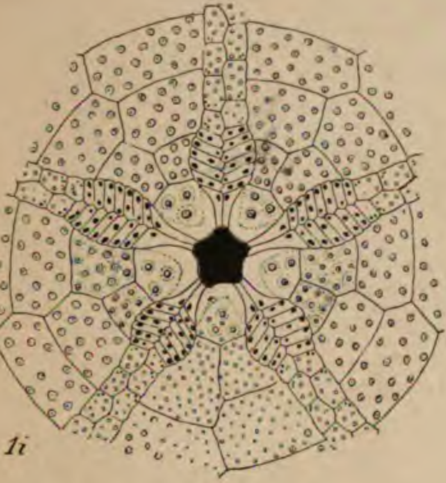
PLATE XXIX.

Cassidulus æquoreus Morton (page 68).

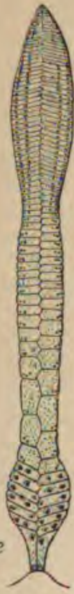
Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Anterior ambulacrum.
1*f*. Several plates, petaloidal region of the same, much enlarged.
1*g*. Ditto, oral region.
1*h*. Apical disk, much enlarged.
1*i*. Diagram showing the arrangement of the plates about the peristomial opening.



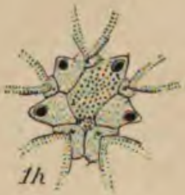
1c



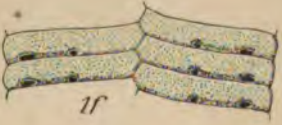
1i



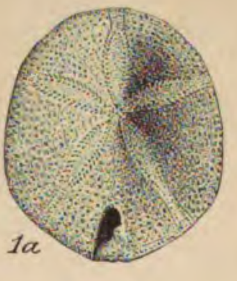
1e



1h



1f



1a

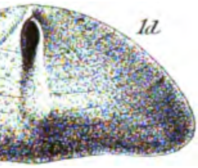
CASSIDULUS.

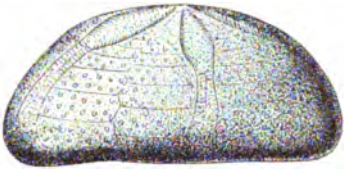
PLATE XXX.

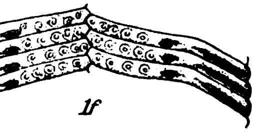
PLATE XXX.

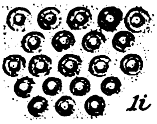
CASSIDULUS MICROCOCCUS Gabb (page 69).

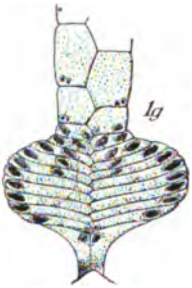
Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Anterior ambulacrum at the base of the petaloidal region.
1*f*. Several plates in petaloidal region of anterior ambulacrum, much enlarged.
1*g*. Oral portion of an ambulacral area.
1*h*. Apical disk, enlarged.
1*i*. Surface of an interambulacral plate, highly magnified.

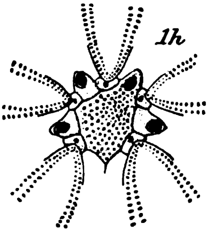

1d

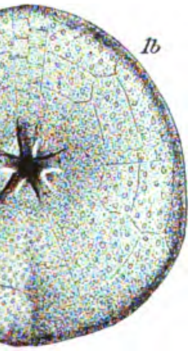

1c

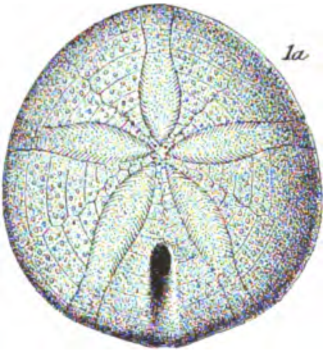

1f


1i


1g


1h


1b


1a

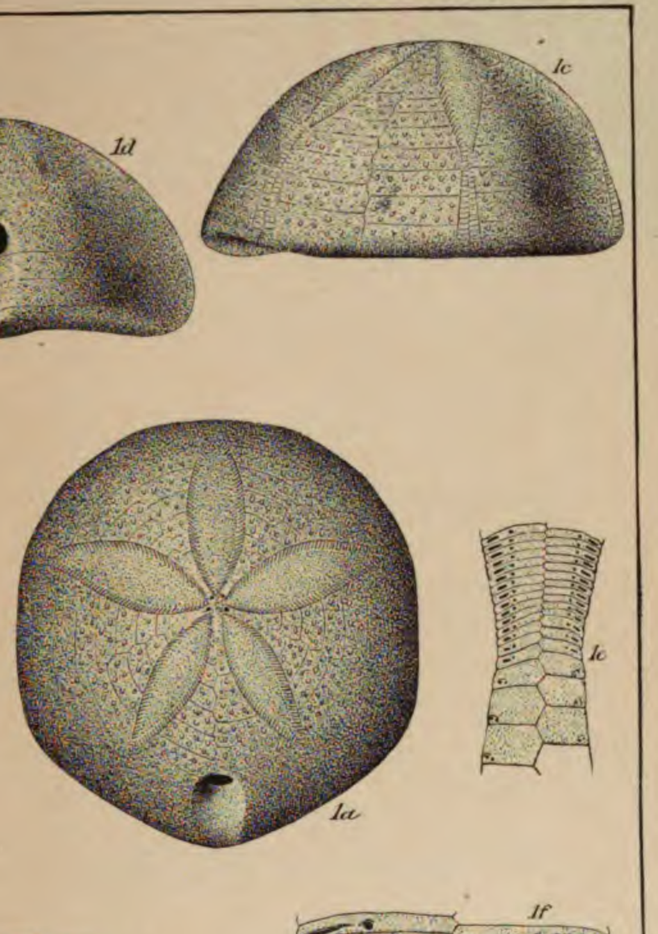
CASSIDULUS.

PLATE XXXI.

PLATE XXXI.

CASSIDULUS SUBQUADRATUS Conrad (page 70).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Lower portion of the petaloidal region of the right antero-lateral ambulacrum.
1*f*. Several plates of the same, much enlarged.
1*g*. Oral portion, much enlarged.
1*h*. Apical disk, enlarged.



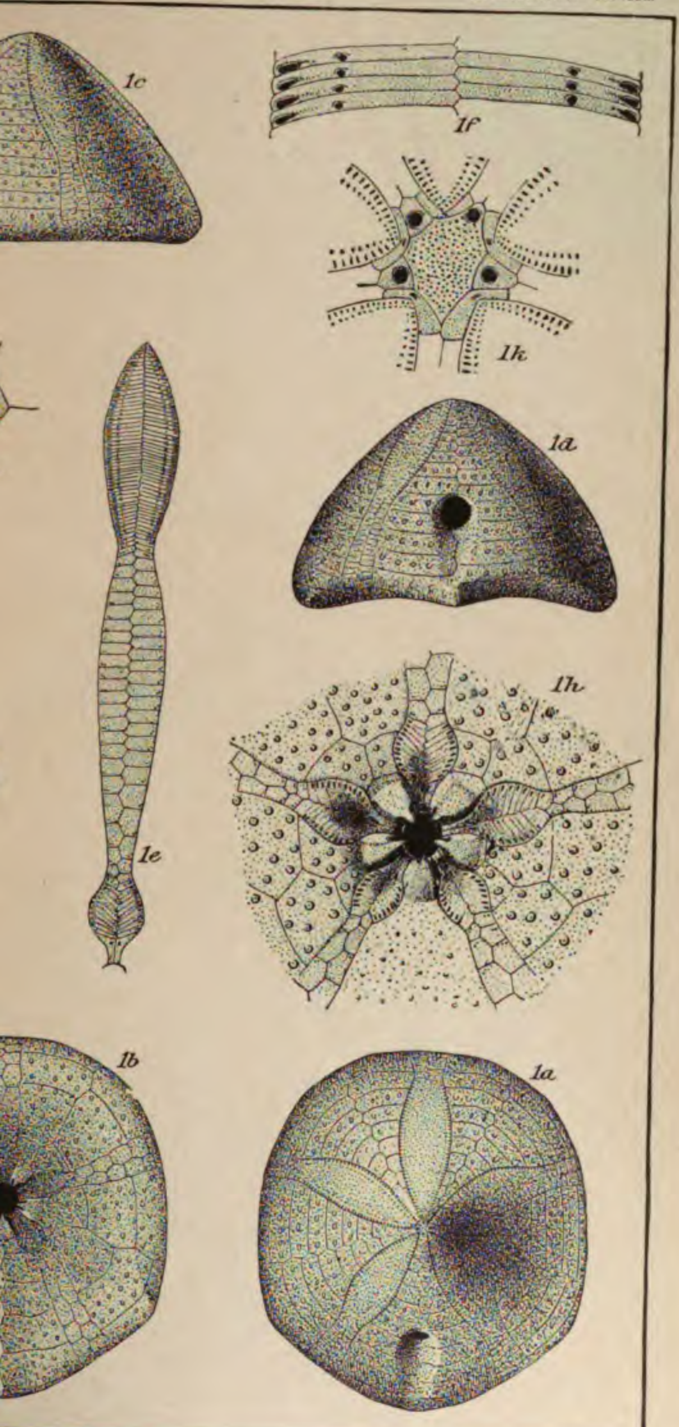
CASSIDULUS.

PLATE XXXII.

PLATE XXXII.

CASSIDULUS SUBCONICUS Clark (page 71).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. An ambulacral area, enlarged.
1*f*. Several plates of the petaloidal portion, highly magnified.
1*g*. Ditto, oral portion.
1*h*. Diagram showing the arrangement of the plates around peristomial opening.
1*i*. Interambulacral plate, much enlarged.
1*k*. Apical disk, much enlarged.



CASSIDULUS.

PLATE XXXIII.

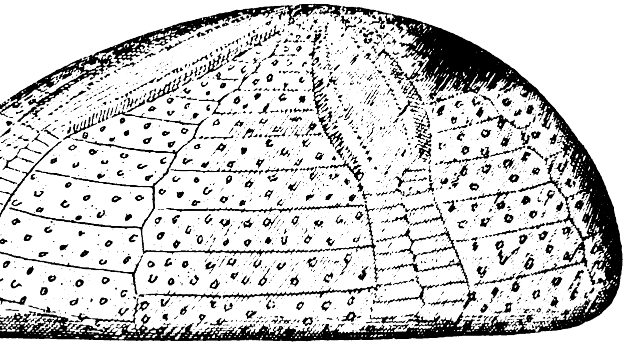
CASSIDULUS PORRECTUS Clark (page 72).

Fig. 1*a*. Upper surface of the test.
1*b*. Posterior view of the same.
170

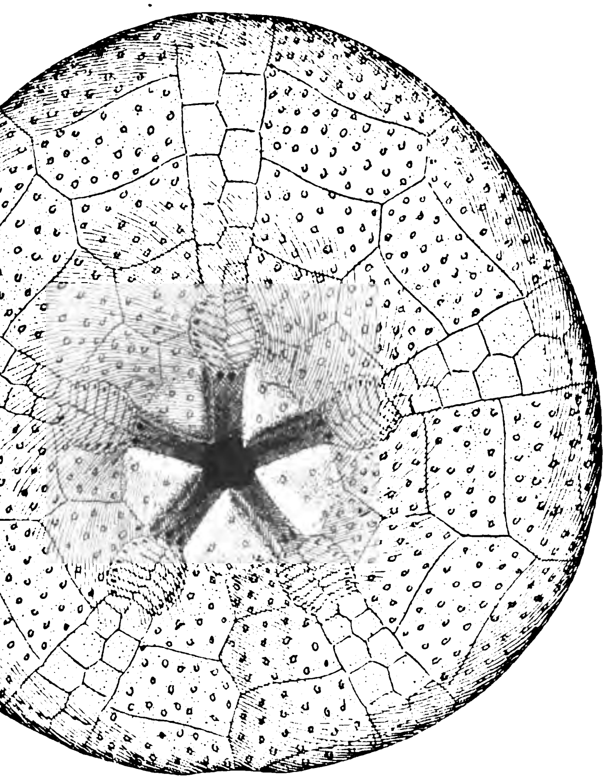
PLATE XXXIV.

CASSIDULUS PORRECTUS Clark (page 72).

Fig. 1*a*. Lower surface of the test.
1*b*. Lateral view of the same.



1b



1a

CASSIDULUS.

PLATE XXXV.

PLATE XXXV.

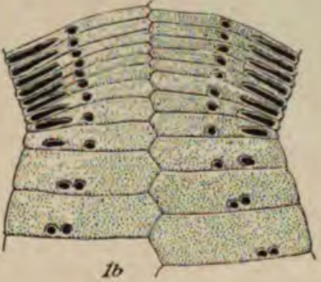
Cassidulus porrectus Clark (page 72).

Fig. 1*a*. An ambulacral area, enlarged.
1*b*. Lower portion of petaloidal region, highly magnified.
1*c*. Central portion of same, highly magnified.
1*d*. Three interambulacral plates, much enlarged.

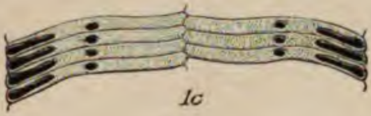
Cassidulus Stantoni Clark (page 73).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the test.
2*c*. Lateral view of the same.
2*d*. Posterior view of the same.

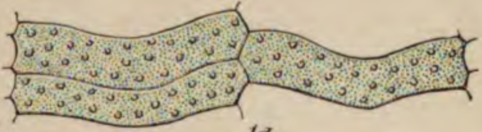
1a



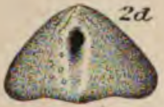
1b



1c

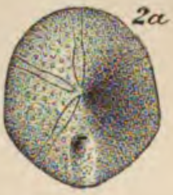


1d

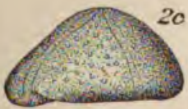


2d

2b



2a



2c

CASSIDULUS.

PLATE XXXVI.

ANANCHYTES OVALIS Clark (page 74).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. Lateral view of the same.
1*d*. Anterior view of the same.
1*e*. Posterior view of the same.
1*f*. Apical disk, enlarged.
1*g*. Ambulacral plates, much enlarged.
1*h*. Interambulacral plates, much enlarged.

PLATE XXXVII.

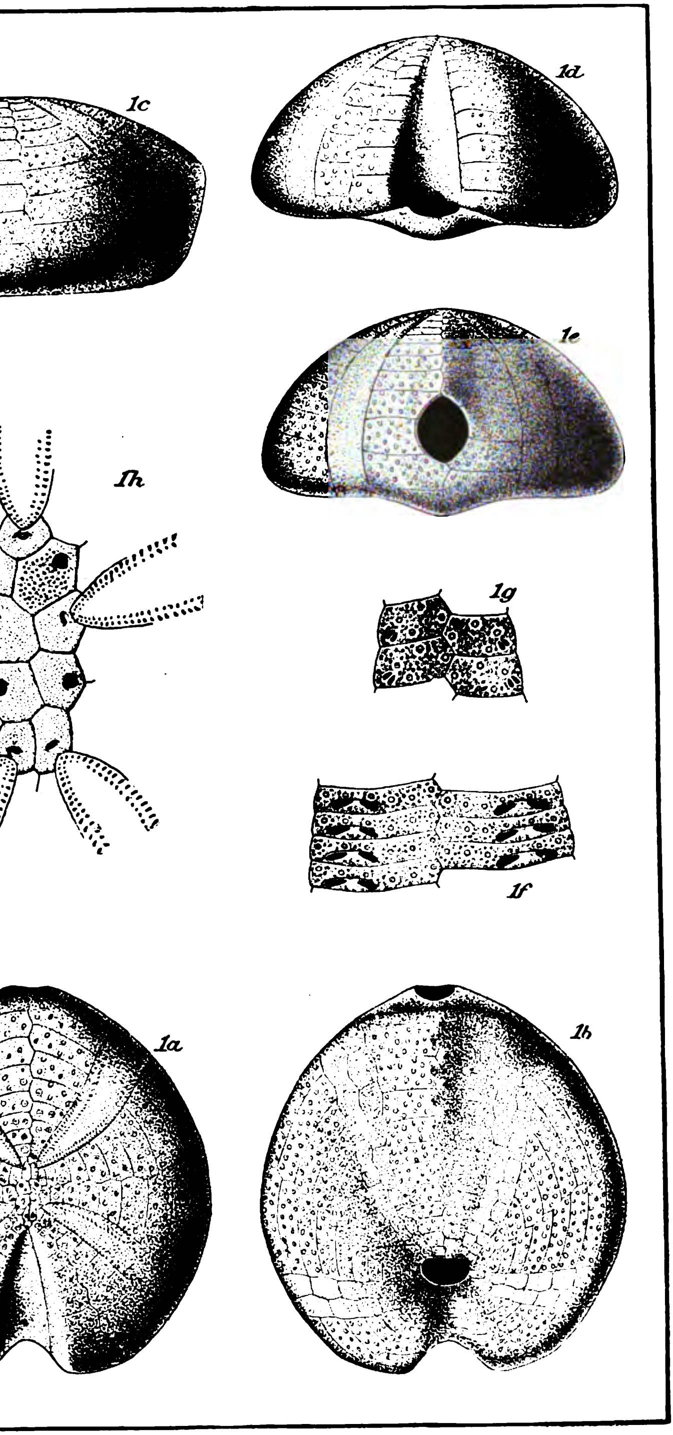
Cardiaster cinctus (Morton) (page 75).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Anterior view of the same.
1*e*. Posterior view of the same.
1*f*. Central portion of the petaloidal region of an ambulacral area
larged.
1*g*. Basal portion, ditto.
1*h*. Apical disk, enlarged.

PLATE XXXVII.

Cardiaster cinctus (Morton) (page 75).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Anterior view of the same.
1*e*. Posterior view of the same.
1*f*. Central portion of the petaloidal region of an ambulacral area, mu larged.
1*g*. Basal portion, ditto.
1*h*. Apical disk, enlarged.



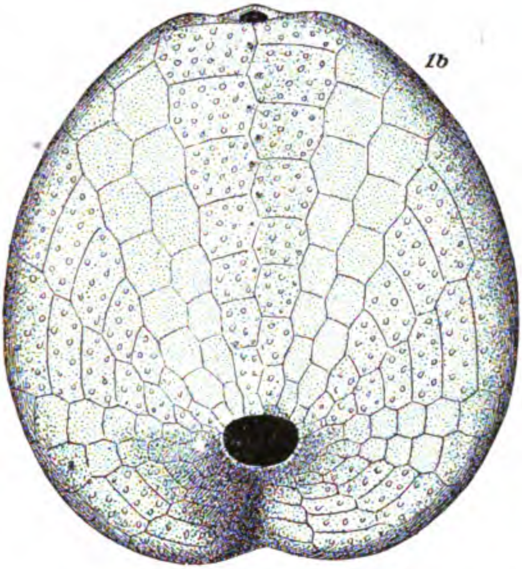
CARDIASTER.

PLATE XXXVIII.

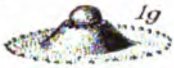
PLATE XXXVIII.

HOLASTER SIMPLEX Shumard (page 76).

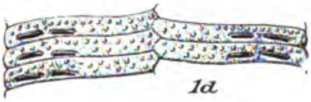
Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. The right antero-lateral ambulacrum, enlarged.
1*d*. Portion of the petaloidal region of the same.
1*e*. Four basal plates of the same.
1*f*. Apical disk, enlarged.
1*g*. Tubercle, highly magnified.



1b

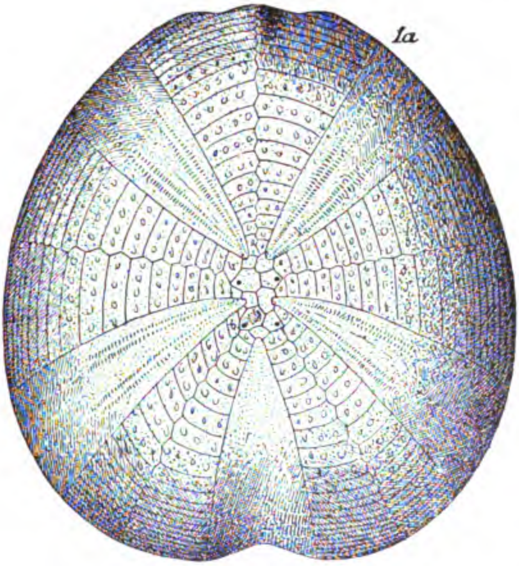


1g



1d

1o



1a

HOLASTER.

PLATE XXXIX.

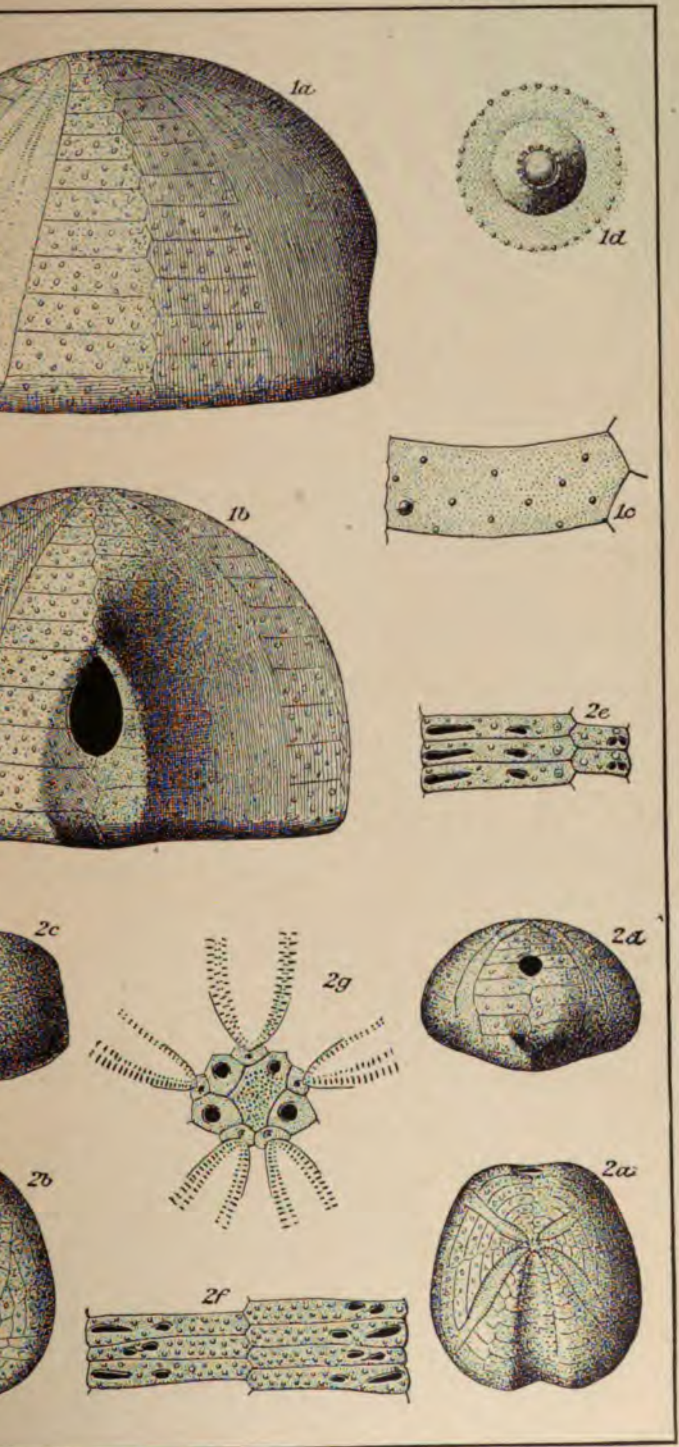
PLATE XXXIX.

Holaster simplex Shumard (page 76).

Fig. 1*a*. Lateral view of the test.
1*b*. Posterior view of the same.
1*c*. Interambulacral plate, much enlarged.
1*d*. Tubercle, highly magnified.

Enallaster texanus Roemer (page 78).

Fig. 2*a*. Upper view of the test.
2*b*. Lower view of the test.
2*c*. Lateral view of the same.
2*d*. Posterior view of the same.
2*e*. Portion of the petaloidal region of the right antero-lateral ambulacru much enlarged.
2*f*. Ditto, anterior ambulacrum.
2*g*. Apical disk, enlarged.



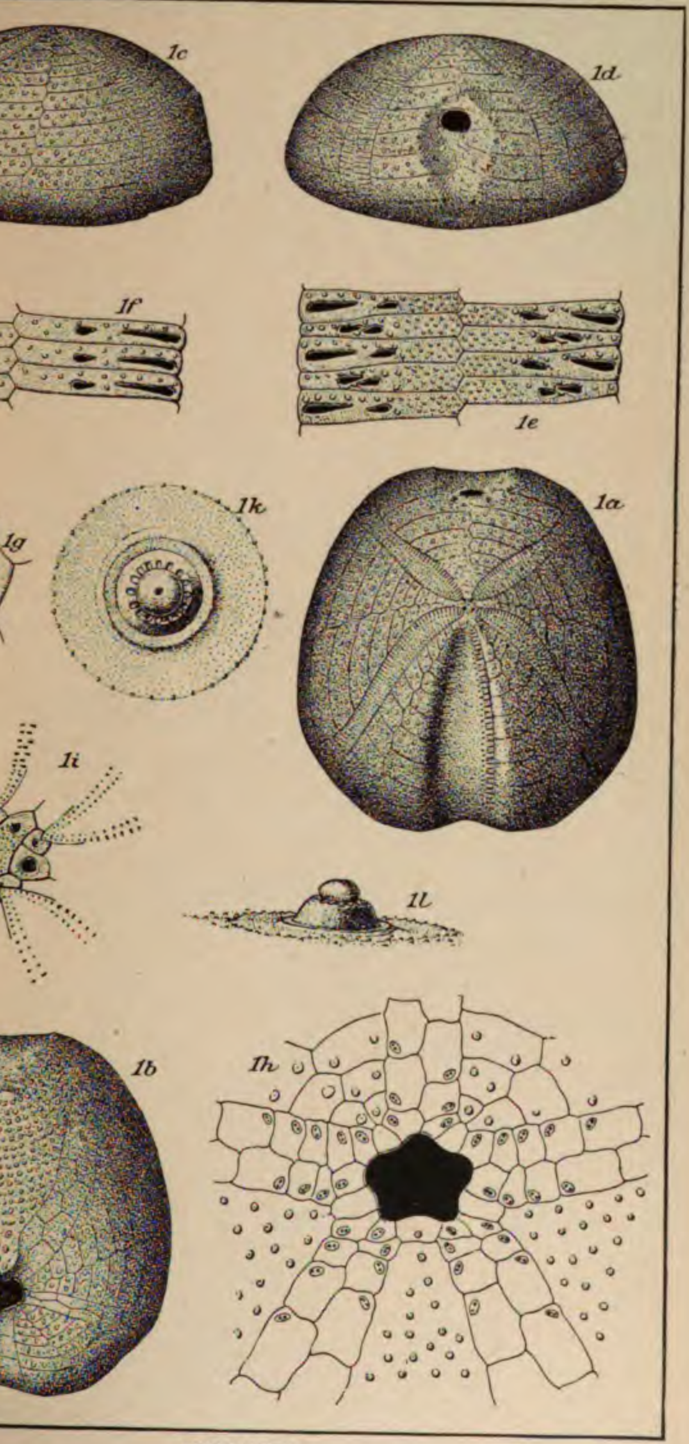
HOLASTER AND ENALLASTER.

PLATE XL.

PLATE XL.

Enallaster obliquatus Clark (page 79).

Fig. 1*a*. **Upper surface of the test.**
1*b*. **Lower surface of the test.**
1*c*. **Lateral view of the same.**
1*d*. **Posterior view of the same.**
1*e*. **Portion of the petaloidal region of the anterior ambulacrum.**
1*f*. **Ditto, left anterior ambulacrum.**
1*g*. **Second plate of the same from the mouth opening.**
1*h*. **Diagram showing arrangement of plates about the mouth opening.**
1*i*. **Apical disk, enlarged.**
1*k*. **Tubercle from above, much enlarged.**
1*l*. **Lateral view of the same.**



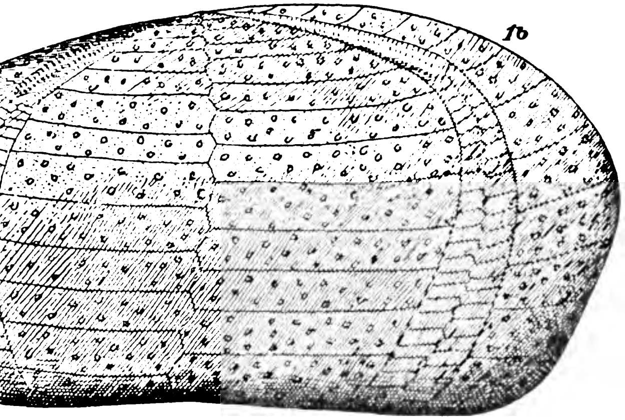
ENALLASTER.

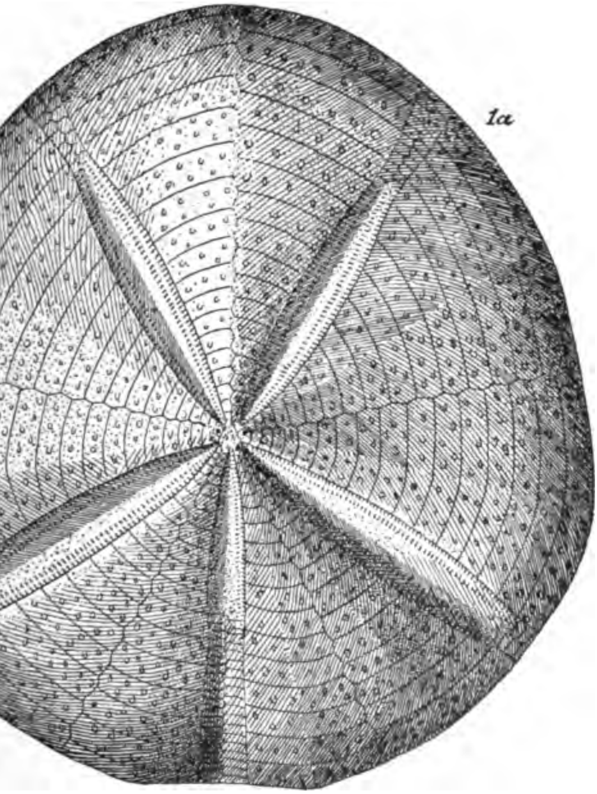
PLATE XLI.

PLATE XLI.

Epiaster elegans (Shumard) (page 80).

Fig. 1*a*. Upper surface of the test.
1*b*. Lateral view of the same.





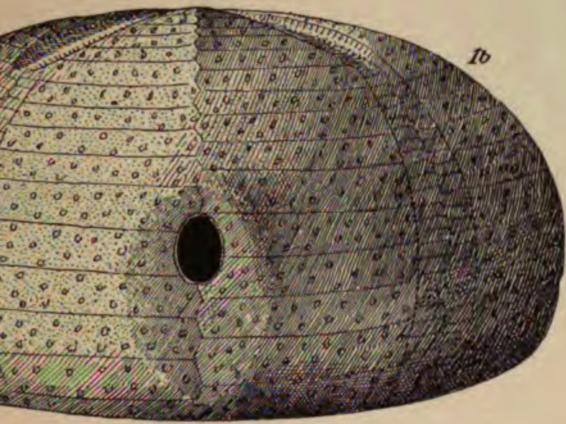
EPIASTER.

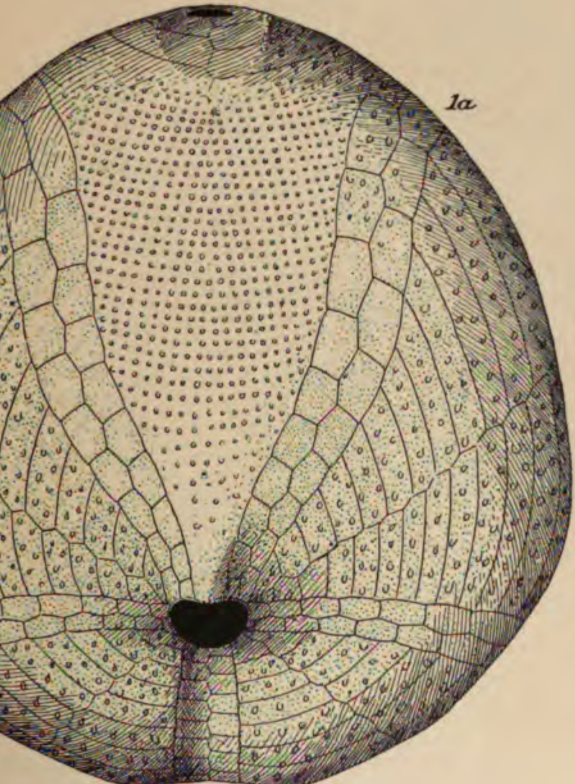
PLATE XLII.

PLATE XLII.

Epiaster elegans (Shumard) (page 80).

Fig. 1*a*. Lower surface of the test.
1*b*. Posterior view of the same.





EPIASTER.

PLATE XLIII.

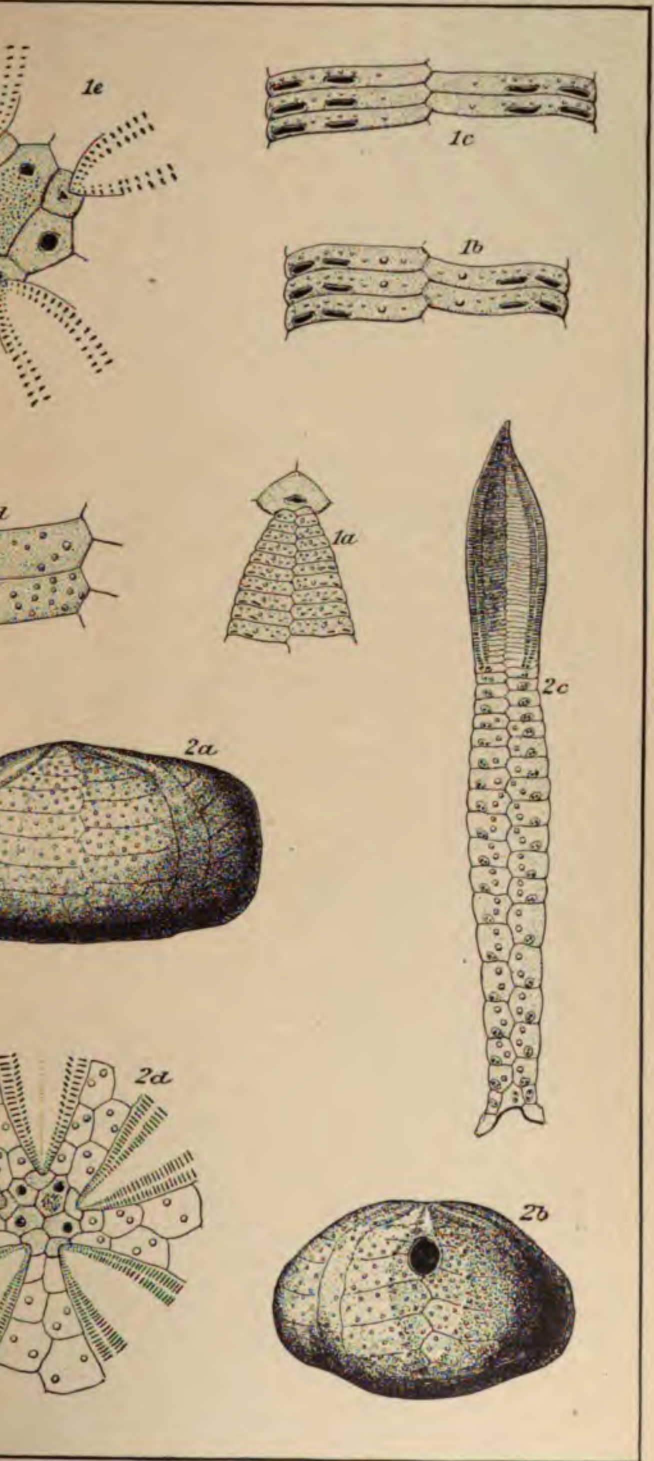
PLATE XLIII.

EPIASTER ELEGANS (Shumard) (page 80).

Fig. 1*a*. Upper portion of the anterior ambulacrum, enlarged.
1*b*. Middle portion of the petaloidal region of the anterior ambulacr magnified.
1*c*. Ditto, left antero-lateral ambulacrum.
1*d*. Two interambulacral plates, much enlarged.
1*e*. Apical disk, enlarged.

EPIASTER WHITEI Clark (page 82).

Fig. 2*a*. Lateral view of the test.
2*b*. Posterior view of the same.
2*c*. Left antero-lateral ambulacrum, enlarged.
2*d*. Diagram showing the arrangement of the plates in the apical bordering areas.



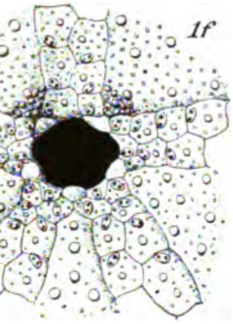
EPIASTER.

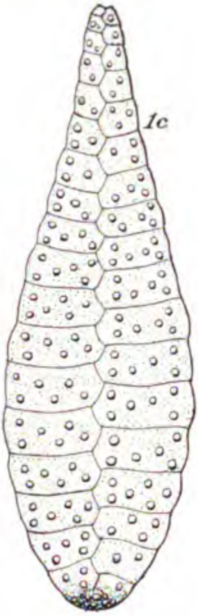
PLATE XLIV.

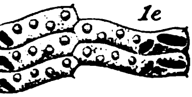
PLATE XLIV.

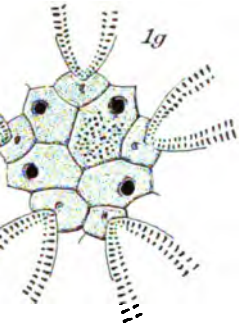
EPIASTER WHITEI Clark (page 82).

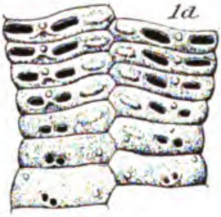
Fig. 1*a*. Upper surface of the test.
- 1*b*. Lower surface of the same.
- 1*c*. Right antero-lateral interambulacral area, much enlarged.
- 1*d*. Lower portion of the petaloidal region of the right antero-lateral crum, highly magnified.
- 1*e*. Several plates of the petaloidal region of the left antero-ambulacru
- 1*f*. Peristomial opening, with surrounding ambulacral and interamb plates.
- 1*g*. Apical disk, much enlarged.

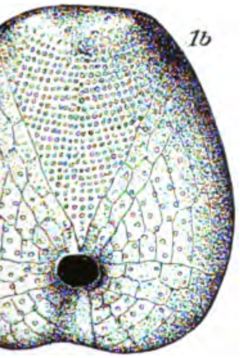


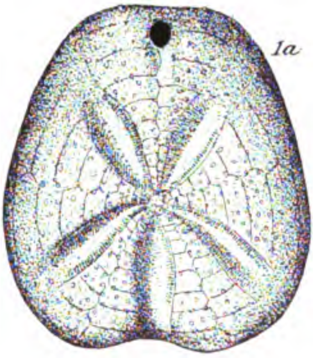












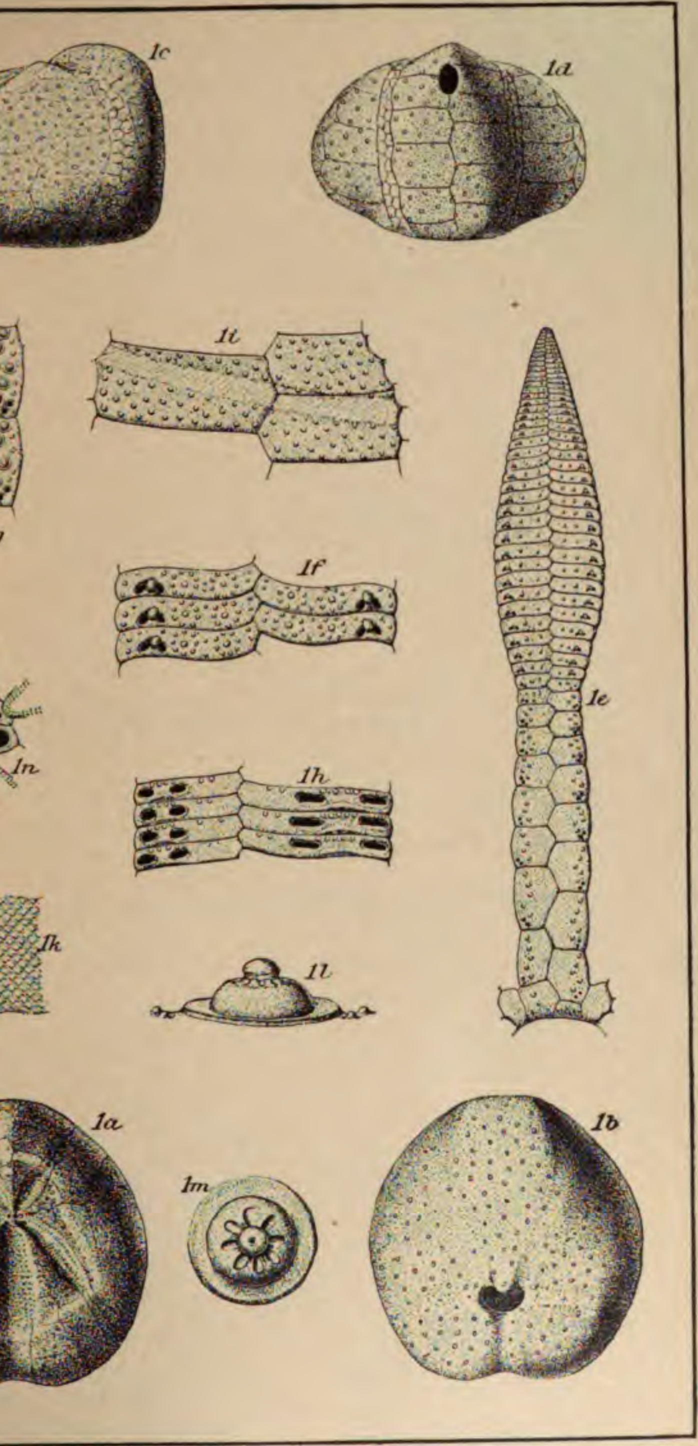
EPIASTER.

PLATE XLV.

PLATE XLV.

Hemiaster parastatus (Morton) (page 83).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Anterior ambulacrum, enlarged.
1*f*. Portion of petaloidal region of the same, highly magnified.
1*g*. Portion of basal region, ditto.
1*h*. Several plates from the petaloidal region of the right antero-lateral lacrum, much enlarged.
1*i*. Three interambulacral plates, with fasciole.
1*k*. Portion of fasciole, highly magnified.
1*l*. Tubercle from the side.
1*m*. Ditto from above.
1*n*. Apical disk, enlarged.



HEMIASTER.

PLATE XLVI.

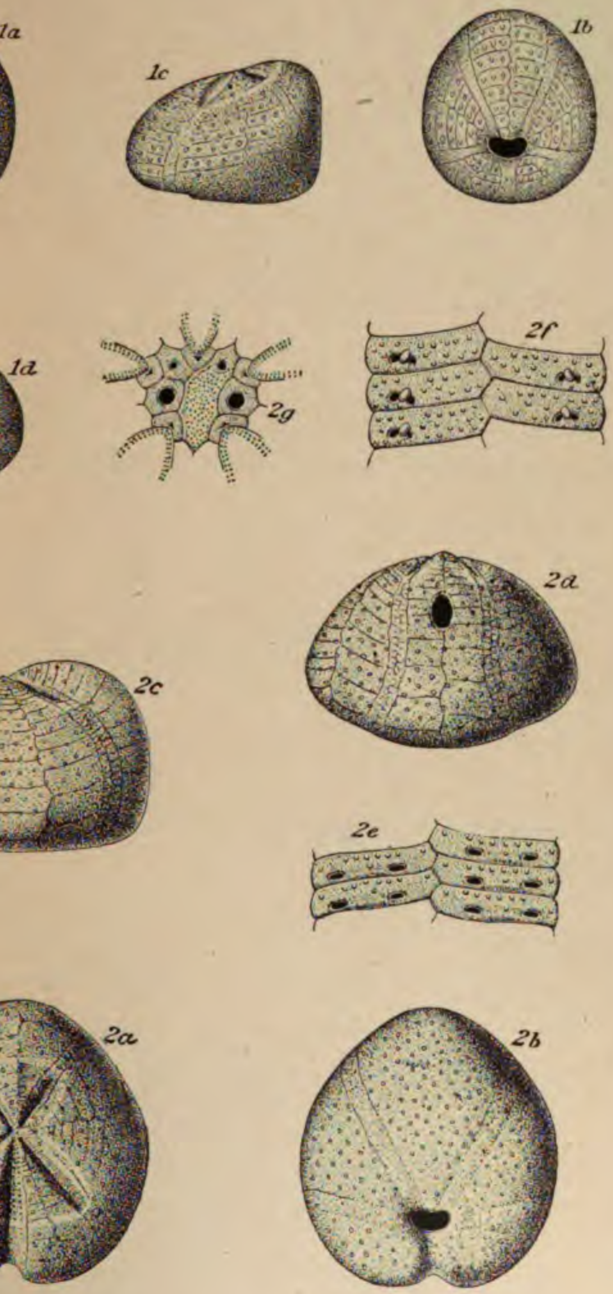
PLATE XLVI.

HEMIASTER STELLA (Morton) (page 84).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.

HEMIASTER UNGULA (Morton) (page 85).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the test.
2*c*. Lateral view of the same.
2*d*. Posterior view of the same.
2*e*. Portion of the petaloidal region of the right antero-lateral amb
much enlarged.
2*f*. Ditto, anterior ambulacrum.
2*g*. Apical disk, enlarged.



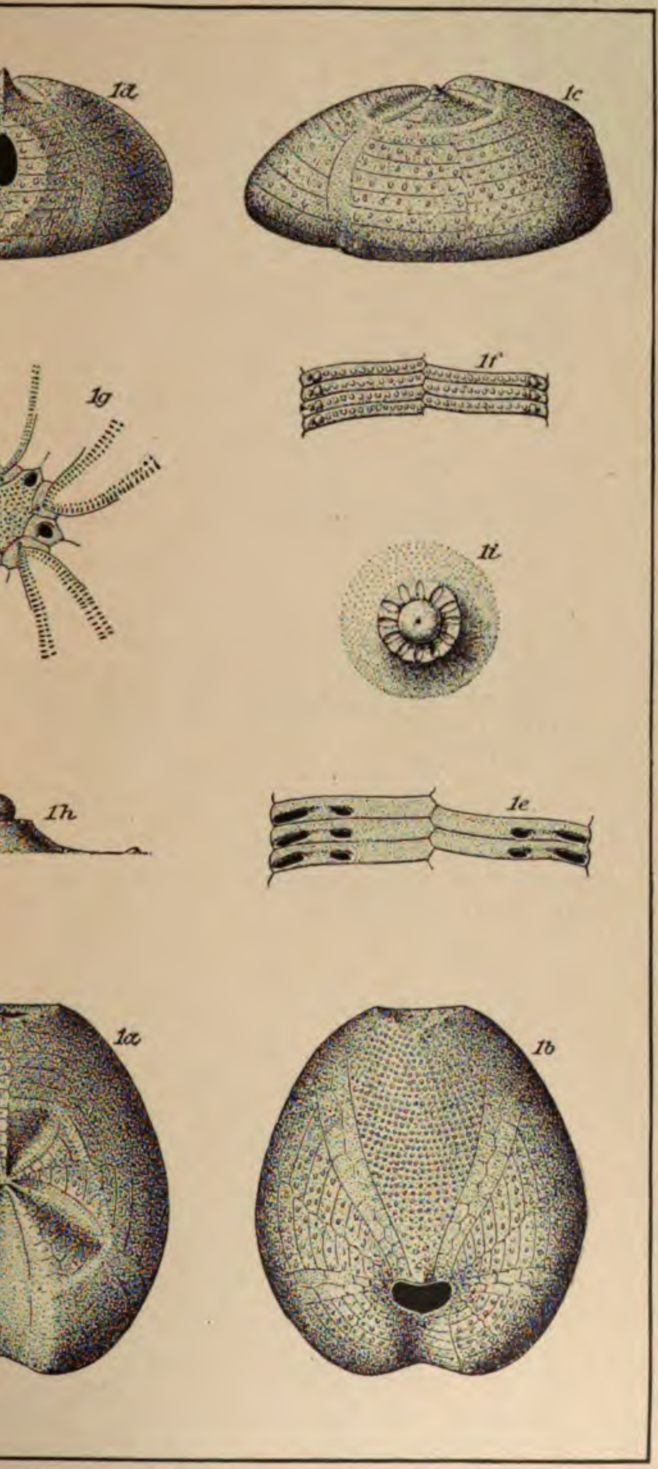
HEMIASTER

PLATE XLVII.

PLATE XLVII.

HEMIASTER TEXANUS Roemer (page 86).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Several plates from the petaloidal region of the right postero-lateral
lacrum, highly magnified.
1*f*. Ditto, anterior ambulacrum.
1*g*. Apical disk, much enlarged.
1*h*. Lateral view of a tubercle, highly magnified.
1*i*. Same from above.



HEMIASTER.

PLATE XLVIII.

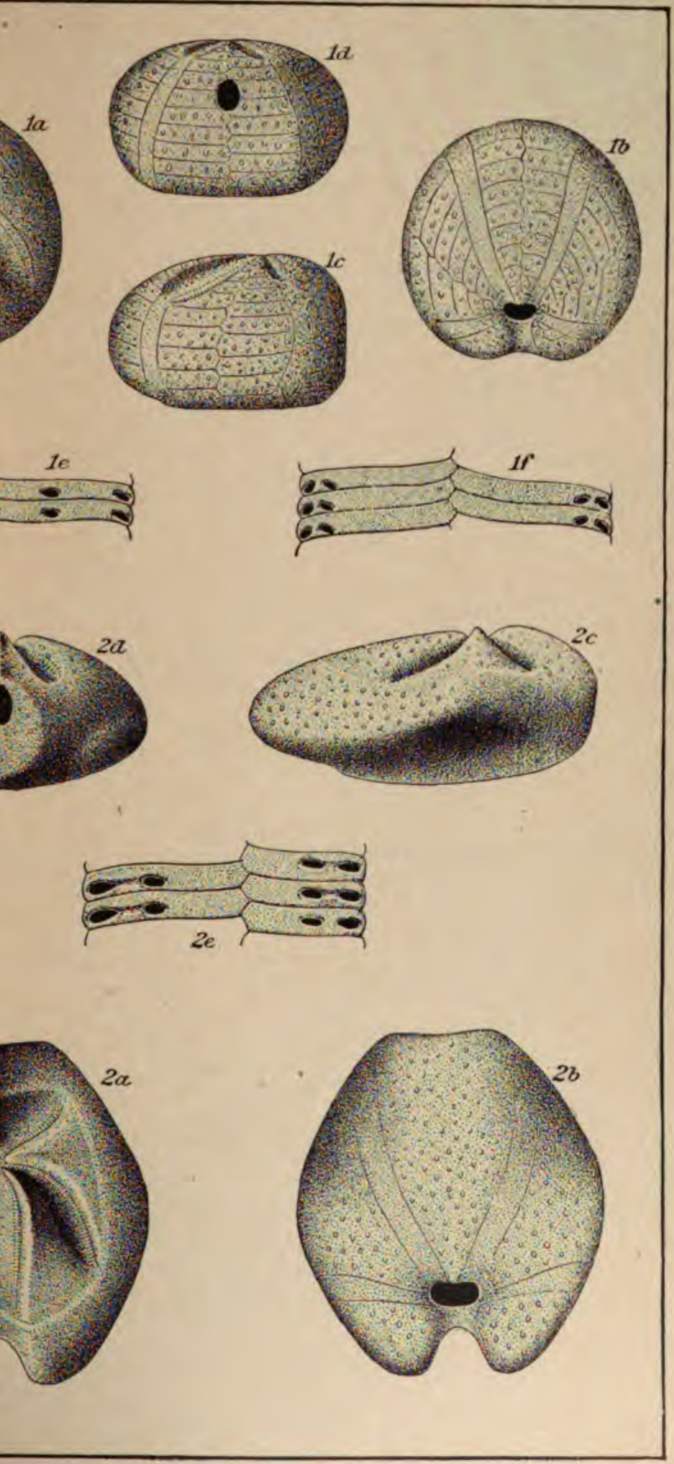
PLATE XLVIII.

HEMIASTER HUMPHREYSANUS (Meek and Hayden) (page 88).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Several plates from the petaloidal region of the right posterior later
bulacrum, highly magnified.
1*f*. Ditto, anterior ambulacrum.

HEMIASTER DALLI Clark (page 89).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the test.
2*c*. Lateral view of the same.
2*d*. Posterior view of the same.
2*e*. Several plates from the petaloidal portion of the left antero-lateral
lacrum.



HEMIASTER.

PLATE XLIX.

PLATE XLIX.

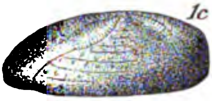
HEMIASTER CALIFORNICUS Clark (page 90).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the test.
1*c*. Lateral view of the same.

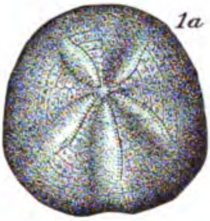
HEMIASTER CALVINI Clark (page 90).

Fig. 2*a*. Upper surface of the test.
2*b*. Lower surface of the same.
2*c*. Lateral view of the same.
2*d*. Posterior view of the same.
2*e*. Several plates from the petaloidal region of the right postero-lateral lacrum, highly magnified.
2*f*. Same, lower portion of petaloidal region.
2*g*. Several plates from anterior ambulacrum.
2*h*. Interambulacral plate, enlarged.
2*i*. Apical disk, enlarged.

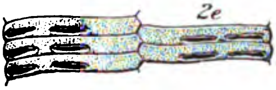
1b



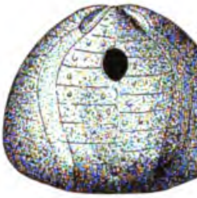
1c



1a

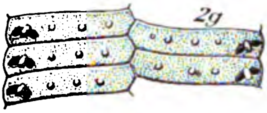


2e



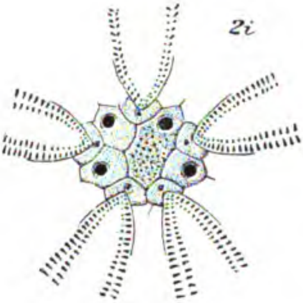
2d

2h

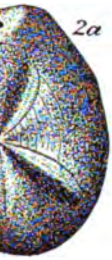


2g

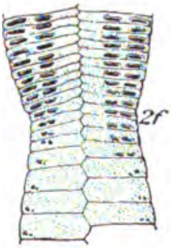
2c



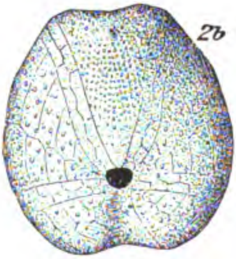
2i



2a



2f



2b

HEMIASTER.

PLATE L.

LINTHIA TUMIDULA Clark (page 91).

Fig. 1*a*. Upper surface of the test.
1*b*. Lower surface of the same.
1*c*. Lateral view of the same.
1*d*. Posterior view of the same.
1*e*. Upper portion of the anterior ambulacrum, enlarged.
1*f*. Several plates from the petaloidal region of the left postero-lateral
lacrum, highly magnified.
1*g*. Apical disk, enlarged.
1*h*. Tubercle from the side, highly magnified.
1*i*. Ditto, from above.

Page

F.

Faujasia florealis 66

G.

Goniaster 32
  mammillata 32, 118
Goniopygus 53–54
  major 54
  Zitteli 53–54, 140–142

H.

Hamites Fremontii 83
Hemiaster 84–91
  americanus 86, 87
  Dalli 89, 200
  elegans 81
  californicus 90, 202
  Calvini 90–91, 202
  Humphreysanus 88, 90, 200
  incrassatus 84, 85
  parastatus 83–84, 85, 86, 194
  stella 84–85, 196
  texanus 86–87, 91, 198
  ungula 84, 85–86, 196
  Wetherbyi 84, 85
Hemicidaris 41–45
  intumescens 44–45, 128
Holaster 76–78
  cinctus 75
  comanchesi 76, 77
  fimbriatus 75
  lævis, var. planus 77
  parastatus 83
  simplex 76–78, 180–182
  ungula 85
Holasteridæ 74–78
Holectypus 58–59
  Castilloi 59
  planatus 58–59, 150
  planus 58, 59
  simplex 92, 93

L.

Leiocidaris 38–39
  hemigranosus 37, 38–39, 118–122
  hemigranosus, Shumard cited on locality 39
Loriol, P. de, cited on Bourgueticrinus alabamensis 25
  describes Coptosoma Mortoni 51–52
Linthia 91–92
  tumidula 91–92, 204

M.

Macraster texanus 81
Meek, F. B., describes structure of Uintacrinus 22
  assigns Uintacrinus socialis to Niobrara group 24
Meek & Hayden first describe Pentacrinus asteriscus 26
Micraster ungula 85

N.

Neumayr, on classification of crinoi
Niobrara group, Uintacrinus socia
  signed by Meek to ....
Nucleolites crucifer ....
  cruciferus ....
  oviformis (Catopygus) ....

O.

Ophioderma bridgerensis ....
Ophioglypha ....
  bridgerensis ....
  texana ....
Ophiuridæ ....
Ostrea congesta ....
  quadriplicata ....

P.

Pedinopsis ....
  Pondi ....
Pentacrinidæ ....
Pentacrinites asteriscus ....
Pentacrinus ....
  asteriscus ....
  Bryani ....
  Whitei ....
Periaster australis ....
Phymosoma texanum ....
Psammechinus ....
  cingulatus ....
Pseudodiadema ....
  Baileyi ....
  diatretum, ...
  Emersoni ....
  Hilli ....
  ornatum ....
  Rhodani ....
  Rœmeri ....
  tenue ....
  texanum 47–48,
Pygorhynchus crucifer ....
Pygurus florealis ....
  (?) geometricus ....
Pyrina ....
  Desmoulinsii ....
  Parryi ....

S.

Salenia ....
  bellula ....
  Desori, comparison of, with S. te
  petalifera, comparison of, with
    ana ....
  texana 40
  tumidula ....
Salenidæ ....
Shumard, B. F., cited on locality of L
  aris hemigranosus ....
Spatangidæ ....
Spatangus columbianum ....
  cor-marinum (?) ....
  parastatus ....
  sp ....
  stella ....
  ungula ....

OUTLINE OF THIS PAPER.

The flora treated in this bulletin comes from the most recent fossilifero within the limits of the lead and zinc region of southwestern Missouri that is to have been laid down before the ores were formed. It therefore furnishe for the earliest limit of a period during some portion of which the rich ores region were deposited.

It is noteworthy as the first flora to be described from any other horizon of boniferous of the state than that at Clinton near the base of the Lower Co ures. It is also the first flora sufficient for correlation that has been made from above the Clinton stage throughout the entire trans-Mississippi Carbon

The assemblage of types, which may be regarded as constituting, in some r an upland flora by reason of its probable altitude of one or two hundred feet above the contemporaneous Coal-measure marshes, is characterized by a p nance of Neuropterids, the presence of numerous Cordaites leaves, the en sence of any remains of the Lycopodineæ except the leaves of one species, scarcity of Calamarian fragments.

All the species are described, several old or uncertain forms, as well as t ferns, being illustrated. Generic and ordinal characterizations are omitted in cases where recent discoveries as to the nature or relation of the group it seem desirable.

An examination of the distribution of the species and of the facies and affi the flora leads to the conclusion that the plant-bearing outliers belong to the Coal-measures, with an indicated stage near, probably above, the middle series.

THE OUTLYING CARBONIFEROUS COAL
S OF SOUTHWESTERN MISSOURI.

BY DAVID WHITE.

INTRODUCTION.

GEOLOGICAL.

ibed in this report is worthy of consideration in three
furnishes locally a datum subsequent to which the
lead and zinc ores of this region must have occurred,
g been laid down in these basins in the Lower Carbon-
or to the ore formation. (2) The collection constitutes
st flora that has been studied and described from any
e lower part of the Lower Coal-measures in the Car-
es of the trans-Mississippi regions. It is therefore of
d of considerable importance, although the fossils do
ure of their occurrence constitute the flora of a single
on in a section of the Coal-measures. (3) The position
relations of the outliers with which we are concerned
dicate an altitude of perhaps 100 to 200 feet above the
marshes flanking the "Ozark Uplift" at some dis-
which now constitute the coal fields of northern Mis-
n Kansas. We are therefore justified, from the bio-
view, in regarding this assemblage of species, which
on dry land or near a small upland stream or pond,
stituting an upland flora, as contrasted with that of
ed region westward.

LOCALITIES.

xamined comprises the contents of fourteen boxes, col-
of 1889 by Dr. W. P. Jenney, of the U. S. Geological Sur-
ed in the study of the zinc and lead deposits of the
issouri region. The localities where the fossils were
the order of their richness in species, as follows:
greater number of species were obtained from near
county, Missouri, at McClelland's shaft, Sec. 31, T.
These are contained in light ash-colored somewhat

arenaceous shales with minute particles of mica. In portions they are more massive and are sandy and rather darker.

II. Several species, belonging mostly to *Neuropteris*, were found in similar shales at the Hannam shaft, 1 mile northeast of Carterville, Jasper county. These shales are rather finer and more compact, weathering a light brownish tea color.

III. From a shaft 1 mile north of Aurora, Lawrence county, a small bundle of specimens was collected in May, 1891. The shales containing the fossils are lighter than those described above, with less sand. The plants are poorly preserved, though numerous, the thicker tissues and leaves of *Cordaites* being somewhat infiltrated with pyrites.

IV. A few fragments were collected from the north end of the Bay State lease near Joplin, Jasper county. They consist of a dark coarse sandstone, somewhat laminated, filled with small fragments of vegetable matter, chiefly stems, either charred or replaced wholly or in part by marcasite.

V. A number of specimens of black coaly shale from the Bristow land, Sec. 15, T. 28, R. 33, 4 miles north of Joplin, Jasper county, contain lamellæ composed almost exclusively of fragments of *Cordaites* leaves and stems. The latter are either too small or too ill-preserved for satisfactory identification.

MODE OF OCCURRENCE.

The small basins from which the plants in hand were collected were all eroded in a limestone considered on the evidence of its fossils to be "of Warsaw–St. Louis age." At other points of the Ozark Uplift, such outlying basins are found in the Burlington and Chouteau limestones of the Lower Carboniferous, and even in the upper limestones of the Magnesian series of Swallow, of Lower Silurian (Ordovician) age. Whether these outliers in the zinc region are of the same date as those found in Lincoln, Warren, Montgomery, Calloway, Cole, and other counties, which have generally been regarded as contemporaneous with the lowest of the true Coal-measures in western Missouri, remains undecided, no plants having, so far as I can learn, yet been collected or studied from any of the latter[1] deposits.

The geology of this region, which will form the especial subject of Dr. Jenney's report, has been discussed in many state and individual publications, particularly in Messrs. Adolf Schmidt and Alexander Leonhard's valuable report included in the volume issued by the state survey for 1873–1874.[2]

For the purpose of indicating, in the present paper, the relation of the plant-bearing shales to the adjacent terranes, a description of the basin at McClelland's shaft will suffice. Moreover this outlier furnished on of the data on which the chronological conclusions

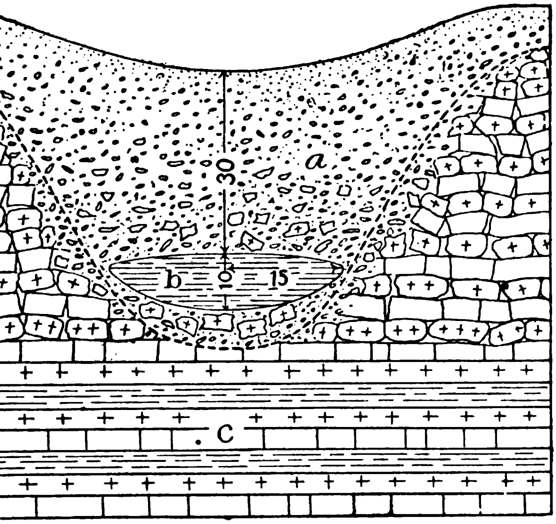
---

[1] It is not assumed that the outliers scattered from northern Arkansas to Wisconsin and Michigan are all of the same age.

[2] Jefferson City, 1874. See pp. 381-734, with 28 plates.

l's shaft the basin affects the surface topography as ' The depression occurs in a peculiar series of the rous, consisting of loose layers of chert brecciated in te limestone strata, more or less dissolved and re- sils, determined by Prof. H. S. Williams, are character- aw and Chester groups. The bottom of the depression se chert. The walls, composed of the same formation, at broken. On this loose floor rests the lenticular body ten feet in thickness, very convex below and slightly The basin at this level is about thirty feet in diameter. tended from the shaft in the center following the plant- the wall of the sink on one side, a distance of fif- the top of the shales to the surface, about thirty feet, s filled with loose chert, gravel, and recent material

ving section, drawn semidiagrammatically, is prepared ndly furnished by Dr. Jenney, to whose notes I am in- ief description of the formation in advance of his own



natic section of outlier at McClelland's shaft; Sec. 31, T. 28, R. 33.
and wash.
s.
hert and limestone, more or less broken, the interstices filled with ore. (The well represented in the diagram.)

rtant events relating to the formation of the fossilifer- (1) The flexure of the strata and fracture of the chert tter part of the Ozark uplift, which elevated this region, near the close of the Lower Carboniferous, to a considerable above the Carboniferous sea lying to the westward. (2) The and removal of the fissured alternating limestones by surfac charged with carbon-dioxide, continuing for a long period and ing innumerable passages, crevices, and chambers, often permit interlarded chert layers to crush for want of support. This mining has occasionally been so extensive as to result in a col all the overlying rock, producing a sink or pothole, such as scribed, that is apparent in the surface topography, and whi cates to the prospector the existence in the subjacent rocks o bers, pockets, etc., containing the ores. (4) Such a sink exi came into existence, in the early Carboniferous, constituting pond which was filled with sediments burying portions of th that grew in the shallows or near the borders. (5) After fillin point of erosion by drainage, no more sediments were perhaps d until the Pleistocene, when the outlet, which was probably a tr to the Carboniferous river described by Winslow[1] and others, m been obstructed and the process of washing in gravels and det newed. (6) At some time during the interval between the de of the shales and that of the superimposed gravels and detrit deposits of zinc blende and galena were formed in the passages, caverns, and interstices of the limestone and chert, frequently fil chambers and constituting large masses and pockets. At th time dolomite, with minute quantities of chalcopyrite, greenock marcasite were formed. Quartz and calcite rarely occur as g Many other minerals have subsequently been formed by alt The dense mass of clay shales was penetrated for a foot or mor solutions carrying lead and zinc and contains near its borders ous perfect crystals of galena and blende, often distorting and ing portions of the plant remains, and showing that the depos the ores was later than the preservation of the plants. The sh nearly horizontal, and but slightly disturbed, the disturbanc apparently due to the irregular settling of the mass consequen subterranean erosion of the underlying terranes.

The vegetable remains are generally well preserved, the laminæ being brown or dark, and distinct, while the stems and portions are carbonized. But in the coarser matrix the preserv hardly so good, especially for the study of the nervation. A the plant fragments lie nearly normal to the bedding. The su the rock specimens from certain horizons in the finer sediments i covered by plant remains presenting on the same stone associat cies of great diversity in form and relationship.

---

[1] Bull. Geol. Surv. Mo., No. 1, pp. 14–20, 1890.

PALEONTOLOGICAL.

the following species I have sought to make the diag-
was expedient from all the material at my disposal in
as complete a differentiation and characterization as
species, and to render its identification by other
r localities more exact and less difficult.

ervice to geology will, I trust, be accomplished in the
ifferentiation of the species and forms. If we admit as
nodifications in many species enduring through a long
in the course of time, or amid changing circumstances,
ses or forms in a fossil state are peculiar to certain
ally within limited regions, it follows that the greater
relation will be attained, and consequently the greater
leontology to geology, by thoroughly diagnosing each
of a species which is sufficiently distinct from all others
tinguishable in any region or series of localities when
cterized. In the ideal point of view any impression that
racter which marks it as different from all other impres-
culiar to a horizon or series merits a characterization
complete distinction; for its value in identifying that
ertain limits is equally important whether it be a good
e of the systematic biologist, or only the track of an
own organism. However, in practice the material at
om the ideal either in quantity or in the degree of per-
is seldom that differentiation has gone with distinct
beyond what are regarded as distinct species.

es, on account of the paucity of material belonging to a
the collection, or for lack of specimens for comparison,
y referred a form to an established species for the pres-
identification is far from satisfactory. In other cases I
species whose forms either represent different portions
nt or do not appear capable of distinction when repre-
l suite of specimens from any locality.

ic arrangement of the groups represented in this flora
The relations of many of them are now the subjects of
ements among paleontologists, while the knowledge
ing from the study of internal structure and fructifica-
requent readjustment of the lines of classification.

at my coworkers, whether in the laboratory or the field,
assistance in identifiying our species, a task which is
hen the student has no other aid than the descriptions
our American literature on the Carboniferous plants.
owed is that employed by the distinguished paleobot-
Zeiller, in his classical work on the coal flora of the
sin, and to that work I am much indebted for aid and

In taking up the systematic study of our Carboniferous flora v
was left by its chief architect and devotee, Prof. Lesquereux, it
come apparent that a certain amount of revision to suit the p
of the science, and of recharacterization accompanied by reexan
of collections, is necessary; but such faults as are found in the
condition of American Paleozoic paleobotany are easily explaine
we remember his failing powers of memory and vision during
years, and the great physical disadvantages under which his la
performed and which win for his life work the highest admirat
distinction, especially from those who through scientific or frie
tercourse learned the beauty and simplicity of his personal ch

Grateful acknowledgments are due to Mr. R. D. Lacoe, of P
Pennsylvania, and Dr. J. H. Britts, of Clinton, Missouri, f
courtesies in transmitting authentic specimens from Lesquereux
for comparison; and particularly to Mr. Lacoe for valuable coun
information given during the preparation of this manuscript.

SCRIPTION OF THE SPECIES.

. VASCULAR CRYPTOGAMS.

EQUISETINEÆ.

CALAMARIÆ.[1]

CALAMITES Suckow. 1784.

LAMITES (EUCALAMITES) RAMOSUS Artis.

nosus Artis, Antedil. Phytol., Pl. ii. 1828: Brongniart, Hist. Vég.
7; Pl. xvii, Fig. 5 (non 6). 1835: Gutbier, Abdrücke, p. 18; Pl. ii,
48: Sauveur, Vég. foss. Belg., Pl. ix, Fig. 2; Pl. x, Figs. 1, 2. 1858:
x, Geol. Penn., ii, p. 850. 1866: Lesquereux, Geol. Surv. Ill., ii,
. 1877: Grand'Eury, Fl. Carb. Loire, p. 20; Pl. ii, Fig. 4. 1879:
x, Coal Flora, I, atlas, Pl. i, fig. 2; text (1880), p. 22. 1882: Renault,
foss., ii, p. 163; Pl. xxiv, Figs. 8, 9. 1884: Lesquereux, Coal
p. 702; Pl. xcii, Figs. 1–4. 1886: Zeiller, Fl. foss. Valenciennes,
.v., Fig. 3; Pl. lvi, Fig. 3; text (1888) p. 345. 1887: Stur, Carb.
larer Sch., ii, p. 96; Pl. xii, Figs. 1–6; Pl. xiib; Pl. xiii, Figs.
iv, Figs. 3–5; text figs. 1, 2, 28, 29, 31, 32.
losus Schl., Lebour, Illustr., Pl. ii, Pl. iii.
ucalamites) *ramosus*, Weiss, Steink.-Cal., ii, p. 98, Pl. ii, Fig. 3;
. 1, 2; Pl. vi; Pl. vii, Figs. 1, 2; Pl. viii, Figs. 1, 2, 4; Pl. ix, Fig.
g. 1; Pl. xx, Figs. 1, 2. 1886: Kidston, Foss. Pl. Lanarksh., p. 51.
(*Calamites*) *ramosus*, Kidston, Foss. Fl. Radstock Series, p. 341.
ton, Foss. Pl. Ravenhead Coll., p. 400.
amosus, Schenk, Die foss. Pflanzen., p. 125.

FOLIAGE.

liata Brongn., (pars?), Prodrome, p. 156.
diata, Sauveur, Vég. foss. terr. houill. Belg., Pl. lxvii, Fig. 2.
itz, Verst. Steink. Sachsens, p. 11, Pl. xviii, Figs. 6, 7. 1869:
'oss. Fl. Steink. Westphalens, p. 28, Pl. iv, Fig. 3. 1874: O. Feist-
rst. böhm. Ablag., I, p. 130, Pl. xvii, Figs. 2, 3, 4. 1878: Zeil-
oss. terr. houill., atlas, Pl. clx, Fig. 1, text (1879), p. 24. 1886:
foss. Valenciennes, atlas, Pl. lix, Fig. 8, Pl. lxi, Figs. 1, 2, text
394.
nodosus Schloth., Lebour, Illustr., Pl. iii.
mosa Weiss, N. Jahrb. f. Min., II, (Brief.) p. 273. 1884: Weiss,
l., II, p. 98; Pl. v, Figs. 1, 2; Pl. vi, Figs. 1–7; Pl. x, Fig. 1; Pl.
1, 2.
mosa Stur, Carb.-Fl. Schatzlarer Sch., II, p. 106; Pl. xiib, Figs.
'l. xiii, Figs. 1, 3–9; Pl. xiv, Figs. 3–5.
ucalamites) *ramosus*, Kidston, Foss. Pl. Lanarksh. p. 51, Pl. iii,

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setaceæ is defined and generally understood among botanists, the great family
included therein. I have preferred therefore to adopt the classification coordi-
s within the order *Equisetineæ*, which has been so defined as to contain the
boniferous representatives, of which the living *Equiseta* are but feeble and
s.

FRUCTIFICATION.

1884. *Calamites* (*Eucalamites*) *ramosus*, Weiss, Steink.-Cal., II, p. 98; Pl. v,
Pl. vi, Figs. 2, 3, 4, 6, 7; Pl. xx, Figs. 1, 2.
1884. *Calamostachys ramosa* Weiss, Steink.-Cal., II, p. 180 (266), Pl. xx, Fig
1887. *Calamites ramosus* Stur, Carb.-Fl. Schatzlarer Sch., II, p. 96; Pl. xı
5 (?), 6 (?); Pl. xiib, Figs. 2, 3, 4, 6.

Stems cylindrical, branching, the lower portions and rhizomes
ing roots; internodes slender, generally much longer than
ribs straight, low, $1\frac{1}{2}$–3 or even 4 ^{mm} broad, rounded or obtusely p
at the extremities, minutely striated longitudinally, often marked
versely so as to form rectangular meshes, furrows shallow, $\frac{1}{4}$–$\frac{1}{2}$ ^{mm}
and bounded on the internal casts by two fine indented lines be
which the surface is slightly raised, tubercles often indistinct,
tops of the ribs, oval, rather longer than broad, often absent fro
lower ends of the ribs or represented only by indistinct rounde
tuberances; branches and upper part of the stems slender an
distinctly costate; branching several times repeated, the branc
their cicatrices usually placed diametrically opposite, two at each
or sometimes three or rarely one; rameal cicatrices placed on th
dle of the articulation, large, circular, or oval, a little broade
long, more or less depressed, with a zone of converging furrow
responding to the ribs of the stem, within its borders; final bra
and branchlets foliate, in annulated verticils of radiating, uni
leaves, the latter being lanceolate, narrowed to each end, 5–20^{mm}
and $\frac{1}{2}$–2 ^{mm} wide, the smaller ones nearer the tips of the bra
this foliage is commonly known as *Annularia radiata* (Brongn.) S

This species, now one of the best known of its genus, is a go
ample of the progress made in synthetic work among fossil
during the last decade. The careful studies by the late Dr. W
the rich material contained in the collections of the Prussian G
ical Survey and many other German institutions, the critical ex
tions by Director Stur of the exhaustive collections from the coal
of Bohemia and Moravian Silesia, with comparisons with nu
other collections to which he had access, the constructive w
Grand 'Eury among the plants from the basin of the Loire, and
cially the painstaking and brilliant work of Zeiller and Renault
the collections from the regions of Autun, Valenciennes, and Co
try, have yielded a great amount of data for the revision of th
of the Coal-measures and the future reconstruction of the sys
Paleozoic plants on the basis of a knowledge of the essential
acters in the entire plant, including its fruiting and its internal
ture. Few as are the types whose life history is yet even rel
well known, the increments contributed to our understanding of
widely different types make the last fifteen years an important
in the history of paleobotanical progress. The study of the *Cala*
has been characterized by special activity and enthusiasm reg
both the superficial characters of the various organs and their
scopic structure. The results of all, so far, though establishi
many specific correlations of stems, foliage, and fruitings, go to

the unity of many of the types in the calamarian
al diversity of the types formerly included in the
tself. Sufficient has been learned of the organs be-
s forms of *Calamites* to show that it contains types
ly necessitate its division into several distinct genera.
e, for convenience and a better definition of its char-
s proposed a provisional classification of the stems
genus, which may itself be considered as provisional,
based on the alternation or continuity of the furrows
periodicity of the branch cicatrices, and the relative
rnodes.[1]

his system, *Calamites ramosus* belongs to the group
nching as a rule from every joint, and most nearly
anching *Equiseta*.

tion of the rhizomes and basal tips of the stems, our
the superficial characters of this plant is relatively
lering it, therefore, as a type of the true *Calamites*,
ters will be given somewhat in detail, avoiding as far
etition of those given in the above description.

ots.—Rhizomes undoubtedly belonging to this species
found attached to stems, though the latter are sup-
ginated from the articulations of a rootstock, as in
e genus.

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d by Weiss for the calamitean stems, independent of the other parts of the

I. *Furrows alternating at the joints.*

Weiss.—Branch scars occurring periodically, the scar-bearing nodes being
mber of joints without scars. In most cases there is a regular increase or de-
he internodes or joints occurring between the scar-bearing nodes; e. g. *C.*
illatus L. & H., and *C. approximatus* Brongn.
-Branch scars at every joint; the internodes all of the same length or varying
g. *Calamites ramosus* Artis, and *C. cruciatus* Sternb.
.—Branch scars occurring without definite order, of subordinate importance,
long stretches of the stem; the internodes of equal length or varying irreg-
Suckowii Brongn., *C. arborescens* Sternb.

II. *Furrows not alternating at the joints.*

r. [*Bornia* Sternb. (pars), *Asterocalamites* Schimp.]—Branch scars occurring
es of unequal length.
silen Flora, III. Steinkohlen-Calamarien, II. Abhandl. z. geol. Special-
üringischen Staaten, Vol. V, Heft. 2, Berlin, 1884, pp. 1-204 (87-290), 8°. Atlas,
55, 56, 59, 96, 119, 141).
that this division of the genus, though largely artificial and purely provi-
convenient as an aid in classifying the stems until the true relations of the
determined. It has, accordingly, been followed by several authors, among
Ravenhead Coll., 1889) elevates the groups to generic rank.
hors agree in discarding Sternberg's name, *Bornia*, as confusing to the no-
its synonymic relations to *Calamites* and its original inclusion of species of
laria, it seems only allowable, if that prevalent ruling is to continue, that
efined name should be accepted. Among the later names Schimper's genus
ans. d. Vosges, 1862, p. 321) has priority, and is preferred by Kidston and
rocalamites, chosen by Stur (Culm Flora, 1, 1875, p. 2), after a careful review
d by Weiss largely on account of its appropriate etymology. Its fruit, de-
been shown by Kidston (Ann. Mag. Nat. Hist., May, 1883, p. 297) to be
Pothocites Grantoni.

Stur, in his large work on the *Calamariæ*[1] figures a large fragment 23^{cm} long and about 4^{cm} broad, with five nodes, which he considers a rhizome of this species. It was found oblique to the bedding, with roots passing from the nodes horizontally and conformably to the bedding. A tapering conical base of a stem is still attached to one of the nodes, but it is too poorly preserved to show much except that it is ribbed, and that the segments grow shorter towards the base. Another very large conical base of a stem, springing from a rhizome, is also illustrated[2] under the same name. As in *Calamites ramifer* Stur, the coaly substance is thicker on the rhizome than on the stem. This base is described as 1^{cm} broad at the tip, enlarging to a diameter of 15^{cm} at the height of 18^{cm}, the lowest internodes measuring hardly 3^{mm}. The tubercles at the upper ends of the ribs ("root scars" as interpreted by the author) are seen distinctly at every node, while those on the lower ends of the ribs ("leaf scars") are seen only rarely on the coaly substance. No branch scars appear. No roots are seen on these two stem bases. Weiss notes the occurrence of rhizomes at the same places with *Calamites ramosus*, which may perhaps belong to that species, but which, on account of the smooth or very slightly ribbed surface, bear an aspect so different from the stems that only organic union would permit them to be considered as specifically identical. Neither Weiss nor Zeiller have been able to identify stems of this species with the lower ends contracted in the form of a reversed cone and with a corresponding foreshortening of the internodes, like that figured by Stur or those belonging to *Calamites* (*Stylocalamites*) *Suckowii.*

To Prof. Leo Lesquereux is perhaps due the credit for first describing, from specimens obtained in the vicinity of Lawrence, Kansas, the rounded, conical, or subtruncate bases of these stems, with their attached roots.[3] The rootlets on these bases are described as simple, $1\frac{1}{2}^{mm}$ in thickness at the point of attachment, and tapering filiform from about 1^{mm} in diameter. He says:

> They penetrate the stone, passing outward and downward in a curve, from their point of attachment in regular rows a little above the tubercles or leaf scars, more rarely upon the articulations, the point of insertion being marked by a deep round perforation about half as large as the convex tubercles to which they are parallel. They are, however, irregular in horizontal distances, the space between them varying from 2^{mm} to 4^{mm}. The whole length of the radicles can not be seen. By a vertical breaking of the block embedding the stems of these *Calamites*, the rootlets are exposed from 1^{cm} to 3^{cm} from their origin to the points where they penetrate the stone. The scars of the rootlets, as well as the tubercles of the leaves and the articulations, are distinctly seen down to the rounded or subtruncate part of the inverted cones which constitute the base of the stems. The lowest articulations, less than 6^{mm} apart, are gradually more distant up to the eighth one, where, at 7^{cm} from the base, the space between them is 15^{mm}. There is no trace of any rhizoma with these speci-

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[1] Die Calamarien der Carbon-Flora der Schatzlarer Schichten. Abhandlungen d. k.-k. geol. Reichsanstalt, vol. XI, 2. Abth., Wien, 1887, p. 4.

[2] Op. cit., p. 8.

[3] Coal Flora, vol. III, p. 702; Pl. XCII, Figs. 1-4.

isolated. But another specimen from the same locality has three
h appear to originate from an inclined stock resembling a frag-
as if they were attached to it like branches, while another grad-
a point or to a sharply obconical base, bears rootlets and merely
by its point, in the same way as are represented by the young
m a horizontal branch in Grand'Eury's Fl. Carb., Pl. I, Fig. 2.
s observed without connection to a parent stock, the basilar point
mall blunt mamilla, smooth or without any trace of fracture or
t, and the radicles are diverging all around the conical base.

description was based on specimens 1½–4^{cm} in diameter.
ow the tubercles to be low down on the costæ of the
rtion, sometimes near the middle of the shorter inter-
ing a considerable portion of the costæ. The specimens
e cabinet of Mr. R. D. Lacoe, of Pittston, Pennsylvania.
identified and labelled by Prof. Lesquereux as *Cala-*
re at present in the fossil plant collection of the U. S.
m. Both purport to come from Ottawa, Illinois. The
and rather soft sandstone, somewhat stained by iron.
agree fairly well with Lesquereux's figures. The larger
pression about 10^{cm} long and 6^{cm} wide, shows neither
the stem nor the extreme lower part of it. It presents
owest segment being about 1¼^{cm} in length, the highest
tubercles are large, circular, and near the tops of the
of pits, apparently on the nodes, marking the origin of
n as represented in the Coal Flora, Figs. 1, 2, the num-
equaling the number of ribs of the segment. A fracture
ws the filamentous appendages illustrated in Fig. 2.
e larger at the lower nodes. The second specimen is a
long, of the contracting base of the stem, but does not
It remains partly embedded in the rock and is some-
but nearly three-fourths of its circumference is exposed,
meter of about 5^{cm} at the top and 2½^{cm} at the bottom of
Five articulations are seen, the highest 2½^{cm} in length,
It resembles Fig. 3 of the Coal Flora. A portion of
pressed shows the low ribs finely striated, the distance
as in undoubted stems of this species. It also shows
r bundles marking by their creases the borders of the
ibs are mostly flat in the upper part of the fragment,
nd and prominent in the lower portion. The upper
ge, well developed, and often protruded. This protru-
es been very great, as is distinctly shown by their hav-
off, sometimes at a distance of 2^{mm} from the rib, the
g twisted obliquely aside, so that in a few cases they
across the next rib. Smaller scars, usually indistinct,
es seen at the bottoms of the larger costæ. No append-
ing to the pits seen in the impression in hand, or in

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[1] Op. cit., Pl. XCII, Figs. 1-4.

those figured in the Coal Flora, are clearly demonstrable on the cast, nor do the elongated tubercles of the cast described above seem to correspond in position with the pits of the impression. In the impression the specific characters are indistinct, the ribs are broader, and the tubercles larger. The pits which were interpreted by Lesquereux to represent the origin of the roots are distinctly seen, in many cases, to be placed at the base of the ribs. Owing to the close interlacing of the ribs at the nodes in the lower segments, these pits are practically on the nodes themselves. They perhaps represent the tubercles at the lower end of the ribs. The pits are circular, and pass down into the rock, and in many cases a portion, at least, of the vascular fibres running along the furrows of the interior internode may clearly be seen to curve and pass down into the larger of the pits. It may be added that the same feature is observable on a tip from the same place identified by Lesquereux as *C. Suckowii*. The internal cast of this base of *C. Suckowii* has internodes more or less concave. The lower ends of the ribs, jutting out very prominently and generally broken, strongly indicate, in the appearance of the fracture, a former protuberance, coinciding with the pits in the impression of the same specimen, these pits remaining hollow to a depth of 6^{mm} or 7^{mm}. The specimens identified by Lesquereux correspond in the much rounded dome-shaped apex, the proportionate length of the internodes, and the disposition of the tubercles with the figures of *C. Suckowii* on Stur's Pl. v, Figs. 5, 6; Pl. XVI, Fig. 1. But one of the distinctive characters of *C. ramosus*, according to that author, lies in their tips being more acute. While the identity of the Museum specimens with *C. ramosus* is very probable, the fragments in the Museum are insufficient to warrant the conclusion that they belong indisputably to that species. Although they agree largely with the base figured, but not described in detail, by Stur (op. cit., p. 8) neither they nor Stur's Fig. 7 correspond in form to the base attached to the specimen figured by the latter as the rhizome of this species. And while the specimens figured by Lesquereux seem to have the characters of *C. ramosus*, we can not consider either the stem bases nor the rhizomes of this species as definitely correlated until they are demonstrated by better material or actual union.

Roots originating at the articulation of the lower portion of the main stems have been described and figured by several authors. These are simple, in fascicles, or sometimes in verticils. Frequently they appear in fascicles or semi-verticils about the lower side of the articulations of the main branches with the stem. They are cylindrical, $4–7^{mm}$ thick, and about $10–17^{mm}$ long, or perhaps longer, tapering to a point. These roots have their surfaces shagreened and are traversed by an axial vascular bundle.

Stems and branches.—This species of *Calamites* is very ramose, the branches dividing in the same manner as the stems. The internodes of the latter are usually $5–25^{cm}$ long, the low ribs $1\frac{1}{2}–3$ or 4^{mm} broad, finely

e furrows $\frac{1}{4}$–$\frac{1}{2}^{mm}$ wide, marked in the cast at each edge
f a vascular bundle, the intervening portion being raised.
are generally swollen toward the joints. The branch
wo, opposite, at each node, though sometimes three, one,
are 1–$3\frac{3}{4}^{cm}$ in diameter. The larger branches, rather
tem, reach a diameter of $3\frac{1}{2}^{cm}$ and have internodes as
The ribs on the branches are narrower than on the stem,
he furrows becoming less distinct. The general diamet-
habit of branching gives the secondary ramification a
ct, although the larger branches frequently give rise to
ite branches from a node. The internodes in the smaller
ne shorter, and the ramification more nearly distichous.
discovery of the dependence of certain forms of *Annu-*
s foliage, on *Calamites ramosus*, was made independently,
e same time, by both Weiss and Stur. The larger foli-
e mostly distichous in pairs $\frac{1}{2}$–3^{mm} in width, with nodes
nely striate, the smaller branches being $\frac{1}{2}$–1^{mm} wide, the
oping. The verticils contain 8–20 uninerved acute leaves,
read out flat and joined at the base in a very narrow ring.
ne leaves varies greatly, those in the larger foliar twigs,
often only touch, measuring 15^{mm} in length, and reach-
he widest part of 2^{mm}, becoming contracted toward the
the smaller verticils are shorter, 7–15^{mm} in length, nar-
nd more acute, the number of leaves to the verticil also
Those on the smallest branches are proportionately
ase and somewhat resemble *Annularia microphylla.* The
e of *Calamites ramosus* includes nearly all the forms that
ribed as *Annularia radiata* (Brongn.) Stb., and Zeiller
fer this entire species to the *Calamites* in question. So
ne long awl-shaped leaves figured by Brongniart in his
otion,[1] and later by Geinitz,[2] which are rare, have not
ched, I believe,[3] to this species of *Calamites*. The true
ata of Brongniart has its verticils from $3\frac{1}{2}$–5^{cm} in diam-
being also much narrower in proportion to their length,
rticils attached to the *Calamites* measure about $2\frac{1}{2}^{cm}$
ving this difference, Weiss and Stur independently re-
ria radiata to Brongniart's typical form, each proposing
ean foliage the name *Annularia ramosa.* The descrip-
s of Stur's *Annularia ramosa* having been prepared in
ss's announcement of the discovery, in which he proposes
ımosa Weiss, appeared in 1881, Stur sues for priority,
lication did not appear till later. However, strict ob-
rules of nomenclature demands priority for *Annularia*

;. foss., 1822, Pl. II, Figs. 7a, b.
sens, Pl. XVIII, Figs. 6, 7.
ynonymy I have cited only those figures which may be referred to as the leaves

ramosa Weiss, the *A. ramosa* Stur being identical with it, and its synonym. The specimens referred by Geinitz[1] and Lesquereux[2] to *Asterophyllites foliosus* and by Lebour[3] to *Calamites nodosus* are possibly *Annularia ramosa* Weiss.[4]

Fructification.—The brilliant discoveries of Weiss and Stur which almost simultaneously established the absolute connection between stem, branches, and foliage of *Calamites ramosus* were further singularly coincident in revealing the fruiting spikes attached to the branches. These strobili are mostly small, slender, and elongated, fixed at the end of the leaf-bearing twigs, or arranged in irregular panicles. The axis is slender, the segments being about 3^{mm} long, the joints surrounded by verticils of very slender, short, acute, sterile bracts, curved outward at nearly a right angle at the base, and turning upward. In the older portions of the spike they arch farther backward, but near the end they curve upward, closing together like a bud at the apex. The sporangiophores spring from the middle of the internodes according to the *Bruckmannia* type. The sporangia are distinct when present, but their internal structure is not yet known. More often they are fallen away. The spikes are usually borne on multinodial leafy twigs, the minute leaves of the latter measuring about $\frac{1}{2}^{cm}$ in length and $\frac{1}{2}^{mm}$ in width. For the strobili of *Calamites ramosus* Weiss proposed the name *Calamostachys ramosa.*

Habit and relations.—The roots springing from the lower articulations of the main stem (not the conical base) and especially at the origin of the primary branches, are construed by some authors as indicating a subaqueous or subterranean habit of growth. The distichous ramification of some of the larger branches and the *Annularia* branchlets, in one plane, are said to argue a floating condition for them, while the others, branching irregularly, including the irregular forms of *Annularia* with the minute leaves, may represent an aerial growth. Stur inclines to the belief that the species is heteromorphous, and that certain *Volkmannia* spikes, found intimately associated, also belong to this species; but as only the one described has been found physically united, the relation of the *Volkmannia* remains in doubt.

Calamites ramosus is most nearly related to *C. ramifer* and *C. Suckowii,* Weiss having referred Stur's *C. ramifer*[5] to *C. ramosus.* Stur in his Calamariæ, p. 116, describes the former as the ancestor of *C. ramosus,* which he regards as representing a later condition of the same type. He describes the rhizome of the latter as similar to the stems, while that of *C. ramifer* requires a careful examination to prove it a *Calamites.*

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[1] Verst. Steink. Sachsens; Pl. XVI, Fig. 2.

[2] Coal Flora, I, p. 39.

[3] Illustrations, Pl. III.

[4] The annularian leaves are well represented in Weiss's Monograph of the *Calamariæ*, Part 2, and Stur's *Calamariæ* of the Schatzlar strata, Pl. XIV, and XIII, Figs. 1–9 of the latter having been made from the same specimen.

[5] Culm-Flora, II, 1877, p. 82 (188), Pl. III, Figs. 3, 3b, 4; Pl. IV, Figs. 2, 3, 4.

ramifer have a thick coaly substance, while those of
s have a very thin, almost membranaceous layer. The
erous form has few branches, often naked for 2–4 consec-
ereas the Carboniferous form branches at every, or
nt, the ornamentation being at the same time slightly
The furrows of the stems of *C. ramosus* are sometimes
imes irregular at the nodes, and quite frequently they
ross the node, continuing along the next interval. The
t is much more common in *C. ramifer*, and would seem
nsition from the *Bornia* type. The stems of *C. ramosus*
e of *C. Suckowii*, as pointed out by Zeiller, by the pro-
ger internodes of the former, the branches not shortened
on of the stem, the ribs often broader, less distinctly
ercles at the upper ends more oval, and the striations
ast less crowded, resembling more those of *C. undula-*
relation of *C. ramosus* and *C. Suckowii* in their ramifica-
artificial character of Weiss's classification and argues
motion of the groups *Eucalamites* and *Stylocalamites* to
eric rank.

presented by several fragments of stems and detached
Clelland's Shaft, near Belleville, and from Aurora, Law-

ANNULARIA Sternberg. 1823.

NNULARIA STELLATA (Schloth.) Wood.

nsius foliatæ Luidius, Lithophyl. Brit., p. 12; Pl. V, Fig. 201.
uchzer, Herb. diluv., p. 19; Pl. III, Fig. 3.
m latifolium Rupp., Walch, Naturgesch. Verst., III. Th. p. 117;
2.
n vulgare Tourn., Scheuchzer, Herb. diluv., p. 63; Pl. XIII, Fig. 3.
eim, Flora Vorw., Pl. I, Fig. 4.
Parkinson, Organic Remains, p. 428; Pl. V, Fig. 11.
stellatus Martin, Petrificata Derb., Pl. XX, Fig. 4.
stellatus Schlotheim, Petrifactenkunde, p. 397. 1832: Schlotheim,
ige Verst., p. 5; Pl. I, Fig. 4.
inulosa Sternberg, Versuch, I, fasc. 2, pp. 28, 32; Pl. XIX, Fig. 4;
xxi.
ta, Sternberg, Versuch, Tent., p. xxviii.
ertilis Sternberg, Versuch, I, fasc. 4, p. 43; Pl. LI, Fig. 2; Tent.,
1837: Bronn, Lethæa geogn., p. 44; Pl. VIII, Fig. 8. 1859: Eich-
næa rossica, p. 187; Pl. XIV, Fig. 9.
ngifolia Brongniart, Prodrome, p. 156. 1845: Germar, Verst. Wet-
ejün, p. 25; Pl. IX, Figs. 1–3. 1849: Brongniart, Tableau, p. 53
52: V. Ettingshausen, Steink.-Fl. Stradonitz, p. 8; Pl. I, Fig. 4.
nitz, Verst. Steink. Sachsens, p. 10; Pl. XIX, Figs. 3–5. 1866:
x, Geol. Surv. Ill., II, Pal., p. 444. 1869: Schimper, Traité, I,
s); Pl. XXII, Fig. 5; Pl. XXVI, Figs. 2, 3, 4. 1869: v. Roehl, Foss.
. Westphal., p. 28; Pl. IV, Fig. 6. 1874: O. Feistmantel, Verst.
ag, I, p. 127; Pl. XV, Fig. 3; Pl. XVI, Fig. 1. 1876: Ferd. Roemer,

Lethaea geognost., I, atlas, Pl. I., Fig. 8; text (1880) p. 150. 1876
foss. Helv., p. 51; Pl. XIX, Figs. 4, 5. 1879: Lesquereux, Coal
Pl. II, Figs. 1, 2, 2a; text (1880), I, p. 45. 1881: Lesquereux,
Surv. Ind., 1879–'80, p. 153; Pl. XI, Fig. 1. 1882: Renault, Cour
II, p. 126; Pl. XX, Fig. 1. 1883: Lesquereux, 13th Rept. Geol.
pt. 2, p. 44; Pl. VII, Figs. 1, 2. 1883: Schenk in Richthofen's
p. 232; Pl. XXXIX. 1884: Lacoe in Lesquereux, Coal Flora,
1889: Lesley, Dict. foss. Penn., I, p. 26 (fig.).

1834. *Asterophyllites equisetiformis* (Schloth.) Brongn., Lindley and Hutto
II, Pl. 124.

1835. *Equisetum stellifolium* Harlan, Trans. Geol. Soc. Penn., I, p. 260; Pl.

1836. *Asterophyllites?* Morton, Am Jour. Sci. XXIX, p. 151; Pl. IX, Fig. 3

1840. *Asterophyllites*, Jackson, Rept. Geol. Surv. R. I., 1839, p. 288; Pl. V

1841. *Annularia*, Hitchcock, Final Rept. Geol. Mass., II, p. 754, Fig. 22
Fig. 3; Pl. XXIII.

1860. *Annularia stellata* (Schloth.) H. C. Wood, Proc. Acad. Nat. Sci., P
p. 236. 1878: Zeiller, Vég. foss. terr. houill., atlas, Pl. CLX, Fig
(1879) p. 26. 1886: Zeiller, Fl. foss. Valenciennes, atlas, Pl. LX
text (1888), p. 398. 1887: Kidston, Radstock Series, p. 343. 1887:
Fl. Schatzlarer Sch., II, p. 55; Pl. XIIIb, Fig. 3. 1890: Renault
Fl. foss. Commentry, Pt. 2, p. 398; Pl. XLV, Figs. 1–7; Pl. XLVI,

1868. *Asterophyllites longifolius* (Sternb.) Brongn., Binney, Obs. Stru
Carb., I, p. 28; Pl. VI, Fig. 3.

1883. (?) *Annularia mucronata* Schenk in Richthofen, China, IV, p. 22
Fig. 10.

1887. *Annularia Geinitzii* Stur., Carb.-Fl. Schatzlarer Sch., II, p. 215; Pl.
1, 2, 3.

1887. *Annularia westphalica* Stur, op. cit., p. 213; Pl. XIIIb, Fig. 2.

1887. *Asterophyllites westphalicus* Stur., op. cit., p. 216; Pl. IVb, Fig. 4.

FRUCTIFICATION.

1826. *Bruckmannia tuberculata* (pars?) Sternberg, Versuch. I, fasc. 4, Te
Pl. XLV, Fig. 2. 1882: Renault, Cours bot. foss., II, p. 129; Pl.
1–6bis.

1828. *Asterophyllites tuberculata* (Sternb.) Brongniart, Prodrome, p. 159.

1876. *Annularia longifolia* Brongn., Ferd. Roemer, Lethaea geognost., I,
Fig. 9; text (1880), p. 150. 1877: Grand'Eury, Fl. Carb. Loire
VI, Fig. 4. 1879: Heer, Urwelt d. Schweiz, p. 16; Fig. 22. 1879:
Coal Flora, I, Pl. III, Fig. 10 (not 11 and 12). 1882: Renault,
foss., II, p. 126; Pl. XXI, Figs. 1–7. 1883: Schenk in Richthofen,
p. 232; Pl. XXXIV, Figs. 4–7; Pl. XXXV, Fig. 7; Pl. XXXVI, Fi
XXXIX; Pl. XLI, Fig. 6.

1876. *Stachannularia tuberculata* (Sternb.) Weiss, Steink., Cal., I, p. 17;
2–4; Pl. II, Figs. 1–3; Pl. III, Figs. 3–10, 12.

1884. *Calamostachys tuberculata* (Sternb.) Weiss (nec Lx.), Steink.-Cal., I

1886. *Annularia stellata*, Zeiller, Fl. foss. Valenciennes, atlas; Pl. LXI,
text (1888), p. 398. 1890: Renault and Zeiller, Fl. foss. Commentr
Pl. XLV, Figs 1, 3; Pl. XLVI, Figs. 4–6.

Stems finely striate, branching distichously opposite at the
tions, all the ramifications lying in the same plane; leaves in
sixteen to thirty-two at the nodes of the branches, narrowly l
spatulate, broadest at the middle, or a little above the middl
towards the base, lanceolate, rather abruptly contracted to
point or somewhat obtuse above, $1-5^{cm}$ long, $1-3^{mm}$ wide, flat
arched, with borders usually reflexed, the entire whorl lying
the same plane as the branches; medial nerve broad and dist

ns in long cylindrical spikes, arranged in verticils at the
rincipal branches or stems, characterized by whorls of
.t the joints of the axis, with alternating whorls of spo-
ituated on the ribs in the internodes, representing a type
the name *Bruckmannia tuberculata* Sternberg.

one of the commonest of the *Annulariæ*, was among the
cribed and finally reconstructed, though the caducous
branches and spikes delayed the definite correlation of
il recent years. Its large, showy verticils are easily dis-
sing it to be one of the most commonly recognized plants
asures.

remarkable specimens of *Annularia stellata* described
Richthofen's China (Vol. IV, Pl. XXXIX), and by Renault
om the coal field of Commentry, showing the foliage
e branches and stems, confirm the view entertained by
d others, that the large trunks known as *Equisetites*
nar[1] are but the stems of this Annularia. The trunk
enk is of calamitean aspect, and is over 5^{cm} in diameter,
ode nearly 13^{cm} in length. Zeiller describes the stems
p. 399) as having a width of 5 to 6^{cm}, with internodes 6
Though it is extremely rare that foliated branches are
l to the large stems, it has been the good fortune of
ed French paleobotanists to find such among the Com-
These discoveries seem to corroborate the description
of Mr. R. D. Lacoe, communicated to Prof. Lesquereux
blished in the third volume of the Coal Flora (p. 706),

r parts of a once large stone upwards of fifty verticils of *Annularia*
ves of which vary from 1½–3½^{cm} in length, the large ones attached
^{a} in width, flattened. These branches come out from larger ones,
wide, and upon the same stone, there is a *Calamites* stem which
he same species and measures 7½–8^{cm} in diameter. The articulations
. One of them, with the branch still attached, which is 18–20^{mm}
oken at its second articulation 35^{mm} from its point of origin. Upon
t of stone there is another limb or branch 12–15^{mm} wide, passing
r large stem in the direction of its other articulation, and to this
ne of the small branches with verticils of leaves. I have no doubt
gments of stems of various sizes belong to the same species.

nate that in the haste of preparation of the third volume
lora this fine specimen could not have been figured.
has minutely described the structure of the silicified
nnularia, finds it to be essentially parenchymatous, with
hin development of the woody zone and cortex, while
ms show a structure not essentially different from the
.

om nearly all of the enlarged joints of the large stems
f branches, arranged distichously, in the same plane.
om ½–2^{cm} in diameter, with intervals sometimes as long

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[1] Verst. Steink. Wettin u. Löbejün, p. 27, Pl. x.

as 7^{cm} very finely, often indistinctly, striated, the verticils touching or slightly overlapping. These give rise in the same to other branches, springing from above the verticils at the joint times nearly at right angles, sometimes more obliquely. The are very long and slender, with a width of less than 5^{mm}. The v of these branches occur at intervals of 1½–3^{cm}, becoming smal overlapping one another sometimes nearly one-half their di Renault and Zeiller illustrate in the second part of the Flora o mentry (Pl. XLVI, Fig. 1) a large slab about 70^{cm} long and 45^{c} almost wholly covered by a portion of the ramification and foliag incomplete segment of a branch or stem of this species. Occas the leaves of *A. stellata* are found flattened in the shales, the r decomposition or pressure. Renault has observed the leaves smaller branches to be as short as 1–1½^{cm}, while the lateral le the larger verticils measured 6–7^{cm}. Notwithstanding its ge uniform habit, considerable variations have been observed in d specimens, perhaps due only to local influences or the circumsta fossilization. Dr. Stur, who has examined many specimens wit painstaking, proposes[1] to divide *Annularia stellata* into three sp which the first, *A. stellata* Stur (emend.), has the margin of the thickened; the second, *A. Geinitzii* Stur,[2] has the upper surface leaves hairy; while the third, *Annularia westphalica* Stur,[3] is terized by its strong stem prominently ribbed with more coa stance, and the closer verticils of rigid leaves radiating t and left, but not covering the stems. A deeply dissected specin longing to the last species he designates[4] as *Asterophyllites westp* on account of its asterophyllitean appearance, such a dual no ture being consonant with the author's view of the occurrence o referable to both *Asterophyllites* and *Annularia* on different the same calamitean plant. It is doubtful whether these diff are constant or of more than varietal importance. Stur's illus of *A. fertilis* Sternb.[5] seems hardly identical with Sternberg' which belongs to *A. stellata*, but in the proportions and laxness leaves it closely resembles *A. ramosa.*

Fructification.—The union of the stems and fruiting spikes ob by several authors in recent years corroborates the opinion long tained that the fruiting of *Annularia stellata* was included am strobili familiar under the name *Bruckmannia tuberculata.* and Zeiller in the atlas of their magnificent work on the Com flora represent (Pl. XLV, Fig. 1) a stem of the *Equisetites lingulat* over 3^{cm} wide, with nodes at intervals of 1½^{cm}, from the six of which radiate verticils of *Bruckmannia tuberculata*

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[1] Carbon-flora d. Schatzlarer Schichten, II, p. 213.

[2] Op. cit., p. 215, Pl. XVI*b*, Figs. 1, 2, 3.

[3] Op. cit., p. 218, Pl. XIII*b*, Fig. 2.

[4] Op. cit., p. 216, Pl. IV*b*. Fig. 4.

[5] Op. cit., p. 216, Pl. XIV, Figs. 6, 7.

45 degrees, while the upper part of the stem, poorly
ate. From the large number of specimens obtained in
basins of France, Zeiller describes [1] the strobiles as dis-
s on the principal branches and perhaps on the stem,
n to a single articulation, often for many consecutive
ediceled, cylindrical, 7–15cm long, with axes 2½–5mm
but quite distinct ribs, the joints provided with
e bracts, while alternating verticils of sporangiophores
the internodes. The bracts are linear-lanceolate,
ering to a point, open or reflexed at the base, then
and slightly inward. They occur in verticils of 16–32,
the joints of the axes, which are 4–6mm apart. The
are arranged in verticils situated in the intervals
t verticils, usually midway between the latter, the num-
phores to the verticil being half as many as that of the
orangiophore bearing four ovoid sporangia at its sum-
li have not been seen in pairs distichously, conforming
mification. Often the upper sporangia are compressed
pressure between the reflexed sterile bracts above and
wded against the sporangiophores so that they appear
latter. Schenk shows that this produces the effect of
ith the convex side upward, so often mentioned in de-
angiophores of *Bruckmannia*. The strobili are seldom
fragments, and then the sporangia are often wanting.
rked by slight scars where the sporangiophores are
[2] describes and figures in detail the internal structure
mens, in which he finds one pair of sporangia above and
ach sporangiophore. The bracts are seen to have a
erve, which is all that shows on some specimens where
ave disappeared. The sporangia consists of sacs
, $\frac{7}{10}$mm thick, and $1\frac{3}{10}$mm in diameter. He found
he upper part of the spike to be spherical, $\frac{4}{100}$mm
d grouped in fours. From the lower part of the
he describes larger spores, $\frac{8}{100}-\frac{1}{10}$mm in diameter,
former but isolated, which he considers as macro-
esence of both microspores and macrospores in *An-*
into closer relations with *Asterophyllites*, thus appear-
ort to the conclusions reached by Stur (Carbon-flora,
ia and *Asterophyllites* are both the foliage of *Calamites*,
senting the floating or submerged branches, the latter
es, on both of which were borne the *Bruckmannia* type
From its structure Renault was led to the generally
f the floating habit of *Annularia*. On the other hand,
on of Lesquereux and Zeiller that some, at least, of the

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[1] Valenciennes, p. 400.

[2] Cours de botanique fossile, 2e année, p. 130, Pl. xxi.

Annularia could not be floating, an opinion that is supported rangement of the strobili about the stem.

Relations.—Neither the base of the stem, the rhizomes, no of *Annularia stellata* are known. Considering this, in conne the facts that the largest known stems of this species are in form, and that the *Annularia radiata*, whose fruiting spik *Bruckmannia* differing but slightly from *B. tuberculata*, is, least, the branchlets and foliage of *Calamites ramosus*, the becomes highly probable that the lower trunk and rhizomes *lata*, when found, will be entitled to a position in the com genus *Calamites*. *Annularia stellata*, as generally understoo distinguished from the other species of its genus. It diffe *radiata* by the greater size of its leaves, which are generally and more spatulate than lanceolate, by the larger number of in the verticil, and their more obtuse apices, and by the dist usually depressed. Its fruit spikes are larger and much lo those of *A. ramosa* or *A. sphenophylloides*, as is seen from th tions. *Annularia inflata* Lx. differs by its inflated leave transverse section, and its obscure or wholly invisible costa *mucronata* Schenk is described as having a rounded tip wit nate point, and the leaves broader near the apex.[1]

In his valuable report on the fossil plants of the Carboni which he has done justice to many early authors, while d service to the science of paleobotany by restoring to use ma that should have priority according to the rules of nomencl generally obtaining in other branches of biology, Zeiller rest Schlotheim's species, identified in this country by Wood, priority over Brongniart's *Annularia longifolia*. This is cert but it should be noted that Martin, in his Petrificata D 1809, a work accepted among paleozoologists, figures, Pl. and describes, p. 25, a specimen as *Phytolithus stellatus*, be his family *Plantitæ*, which, if referable to our species, as it be, would give priority to Martin, as earlier than Schlothei the specific name *stellata* would remain the same. Wheth or Schlotheim has priority depends entirely upon the ident species figured by the former, a question which should be possible, by an examination of Martin's type.

Locality.—The species is represented by fragments of fo well preserved portions of strobili from McClelland's shaft.

ANNULARIA SPHENOPHYLLOIDES (Zenk.) Gutb.

1699. *Rubeola mineralis* Luidius, Lithophyl. brit., p. 12, No. 202.
1771. *Rubia sylvestris* Volkmann, Walch, Naturgesch. Verst., III, p. Fig. 1. 1804: Parkinson, Organic Remains, p. 428; Pl. v, Fig. 3

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[1] Explication de la Carte géologique de la France, vol. IV, pt. 2, Paris, 1879.

erifolia Brongniart, Prodrome, p. 156. 1849: Brongniart, Tab-
. 1853: Newberry, Annals of Science, vol. I, p. 97. 1855: Phil-
Geol., p. 234. 1876: Heer, Fl. foss. Helv., p. 51; Pl. XIX, Figs. 6-
Roemer, Lethaea geognost., p. 150; Fig. 7. 1880: Schimper in
ndbuch Pal., II, p. 167; Fig. 127. 1883: Schenk in Richthofen,
p. 233; Pl. XL. 1887: Stur, Carbon-Fl. Schatzlarer Sch., II, p.
VIb, Figs. 3, 4.
ophylloides Zenker, N. Jahrb. f. Min., p. 398, Pl. V, Figs. 6–9.
henophylloides (Zenk.) Gutbier, Isis v. Oken, col. 436. 1854: Les-
Boston Journ. Nat. Hist., VI, p. 415. 1855: Geinitz, Verst. Steink.
p. 11; Pl. XVIII, Fig. 10. 1858: Lesquereux, Geol. Penn., II, p. 852;
5, 5a. 1860: Roemer, Palaeontog., IX, p. 21; Pl. XI, Fig. 1. 1860:
x, 2d Rept. Geol. Surv. Ark., p. 314. 1866: Lesquereux, Geol.
Paleont, II, p. 444. 1869: Schimper, Traité, I, p. 347; Pl. XVII,
3. 1870: Unger, Sitzb. Acad. Naturw. Wien, math. nat. Cl.,
33, Pl. I, Fig. 8. 1874: O. Feistmantel, Verst., böhm. Ablag., I, p.
II, Figs. 5, 6. 1878: Lesquereux, Rept. prog. Geol. Surv. Penn., "Q,"
3: Zeiller, Vég. terr. houill.; atlas, Pl. CLX, Fig. 4; text (1879), p.
Lesquereux, Coal Flora, atlas, Pl. II, Figs. 8, 9; text (1880), I, p. 48.
taine and I. C. White, Permian Flora, pp. 20, 39. 1881: Weiss,
ra d. Steink., Pl. IX, Fig. 47. 1882: Renault, Cours, bot. foss., II,
. XX, Fig. 3. 1882: Sterzel, Zeitsch. d. deutsch. geol. Gesell.,
685; Pl. XXVII, Figs. 1–10. 1883: Lesquereux, 13th Rept. Geol.
, pt. 2, p. 45; Pl. VII, Figs. 3, 4, 5. 1884: Lesquereux, Am. Nat.,
23. 1887: Lesquereux, Proc. U. S. Nat. Mus., X, p. 23. 1887: Kid-
Fl. Radstock Series, p. 344. 1888: Dawson, Geol. Hist. Plants, p.
15b. 1886: Zeiller, Fl. foss. Valenciennes, atlas, Pl. LX, Figs. 5, 6;
, p. 388. 1889: Lesley, Dict. foss. Penn., p. 28 (text fig.). 1890:
nd Zeiller, Fl. foss. houill. Commentry, II, atlas, Pl. XLVI, Figs.

icrophylla Roemer (nec Sauveur), Paleontogr., IX, p. 21; Pl. V,

repontana Stur, Carbon-Fl. Schatzlarer Sch., II. p. 221; Pl. XIIIb,

FRUCTIFICATION.

henophylloides Sterzel, Zeitschr. d. deutsch. geol. Gesell., XXXIV,
XXVIII, Figs. 1–4.
ularia calathifera Weiss, Steink.-Cal., I, p. 27; Pl. III, Fig. 11.
l. Roemer, Lethaea geognost., I, p. 157.
s cf. *calathifera* Weiss, Steink.-Cal., II, p. 178.

mary branches slender, with rather fine longitudinal
pposite at each node, nearly at right angles, biserial,
nd subsequent branches all in the same plane, branches
nearly at right angles, finely striate, usually bearing
ogether but not overlapping, except in the ultimate di-
15 to 20 to the verticil, 3–10^{mm} long, all spread out in
as the branches, the lateral leaves sometimes slightly
he verticil a somewhat elliptical form, spatulate, wedge-
d towards the summit, which is abruptly rounded, with
at the end of the single median nerve, or often emar-
face of the leaves sometimes rough, the borders more
d, frequently touching those of the next leaf; median
ometimes broadening at the apex into an oval or sac-
twice as thick as its normal width.

Fructification in deciduous cylindrical strobili, $4–8^{cm}$ long,
7^{mm} broad, short-pedicellate, situated biserially opposite at th
of the branches, or perhaps in verticils, the joints of the axi
apart, bearing verticils of eight to twelve sterile bracts, the
$3–4^{mm}$ long, $\frac{1}{2}–\frac{3}{4}^{mm}$ wide at the base, close at the point of origin
slightly arched, linear, tapering to a slender point; sporangioph
verticils alternating with and midway between the joints, no
the axis, of the same number as the bracts and alternating wit
with respect to their position on the stem, each sporangiophore b
four ovoid sporangia at its apex; the sporangia, marked with
when well preserved, attached by their smaller ends and hangi
trad.

Like *Annularia stellata*, *Annularia sphenophylloides* is know
from its branches and appendages, although it is possible t
larger observed stems may belong to main trunks of the plan
remarkably deciduous character of the ramification and foliage
species leaves room for the belief that the lower unknown par
be of considerable size, finding their place under some other
somewhere among the calamitoid stems. Schenk, in Richt
China,[1] figures as *Annularia brevifolia* a freely branching s
Calamites about 15^{mm} in diameter with a node $8\frac{1}{2}^{cm}$ long, ass
with leaves belonging to that species, which appears to bear f
spikes like those figured by Grand 'Eury[2] as *Volkmannia pseudo*
regarded by the latter as the fruiting of *Annularia sphenophy*
The stem has the general habit of the branches of *Calamites ram*
Calamites ramifer, and is very likely a branch of a related *Ca*
However, the leaf verticils do not appear in the illustration to
tinctly united to the branches, though their connection is p
as probable as that of the *Volkmannia* spikes. Judging fr
figure, either verticils or spikes may be only intimately associate
the *Calamites*, as is the case with the pinnæ of *Pecopteris* lying
them. The fact that these strobili are quite different from those
organically united to *Annularia sphenophylloides* argues agains
correlation with the latter species. The fact that *Annularia*
phylloides, *Annularia stellata*, and *Annularia ramosa* sustain suc
specific relations one to another, the fact that their fructificati
likewise closely related, and the additional fact that *Annula*
mosa (*Annularia radiata* in part) is but the foliar branch of a *Ca*
all indicate a similar calamitean rôle for *Annularia sphenoph*
The presence at the joints, whence the branches spring, of lan
acute leaves, like those on the stem of the specimen figured by G
furnishes stronger proof than analogy, making it more probable t
Volkmannia, rather than the *Annularia*, is to be considered as
neous, and that the verticils grew on the *Calamites* branches wit
they are intermingled. In the second part of the Commentry

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[1] Vol. IV, Pl. XL.

[2] Fl. Carb. Loire, p. 43, Pl. VI, Figs. 3, 3a.

[3] Verst. Steink. Sachsens. Pl. XVIII, Fig. 10.

[4] Atlas, 2d part, Pl. XLVI, Fig. 7.

 has not yet appeared, Renault and Zeiller illustrate
^{cm} square, nearly covered by a part of the branches
rently entirely originating from a larger stem about
and about 7^{cm} between the nodes, which are provided
erophyllitean teeth similar to those on the specimen
enk. The union between this stem and the largest
t, and the whole of this beautiful specimen doubtless
of a single system of ramification on which the verticils
The larger stems previously recorded were from 8–12^{mm}
des 8–10^{cm} apart.

e greater of the leafy branches are usually nearly at
e stems, and measure 1–5^{mm} in width, with internodes
verticils at the nodes not overlapping. The branch-
in the axis of the verticils and becoming more oblique
of the branch, are ½–1^{mm} wide, with internodes 7–15^{mm}
nal divisions are between ½ and 1^{mm} in width, with
ngth.

leaf verticils vary considerably in their proportions.
nearly uniform in size for the entire length of the
er cases they become slightly smaller toward the tip.
ller branchlets overlap more than those on the inter-
s, the verticils of adjacent branches also overlapping.
verticils show a depression at the center, surrounded
ow ring where the bases of the leaves join together
em. The fact that the verticils are sometimes slightly
ht by some authors to indicate that when living they
the plane of the ramification. Occasionally the leaves
inflated, by reason, perhaps, of an aqueous habitat.
r obcordate, the end of the nerve concealed or visible,
arged to twice the natural size and appearing bladder-
The surface of the leaves is rough under the lens, and
ved shows a series of filamentary markings radiating
o the margin. These appear to be composed of rows

nt work on the *Calamariæ* of the Schatzlar stage[1]
Annularia brevifolia from *Annularia sphenophylloides*
differentiating a new species, *Annularia sarepontana*
ntiated by the eminent Austrian paleontologist, *Annu-*
as the same form of leaves on branches and stems,
riation in the size of the verticils; *Annularia spheno-*
edge-shaped leaves on the secondary branches, etc.,
aves on the stem, the upper side of the leaves covered
scales. *Annularia sarepontana* branches much more
others, having over twice as many intermediate
er twice as large, and the surface of the leaves marked

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[1] ndl. d. k.-k. geol. Reichsanst., vol. XI, Abth. 2, Wien, 1887.

in a netted form like the nervation of *Lonchopteris*, but the retic is invisible without the aid of a glass. According to Stur the f cation known as *Stachannularia calathifera* Weiss belongs only last-named species, since he regards that as the only species fo the same horizon.

Of these three species of *Annularia* it is probable that the fir are inseparable, and they have been considered so almost unive The last species is perhaps a more robust form of the other, and to be separated partly for geological reasons. Of the figures re to in the above synonymy all but that given by Geinitz appear resent *Annularia brevifolia* as defined by that author. Some American specimens show the filamentary markings of *Ann sphenophylloides*, and all that I have seen have the verticils of th form on the stems. One specimen in the collection of the U. S. N Museum shows a ramose stem with several pairs of branches from it, the verticil at the base of the lower pair being compo lanceolate leaves like those in Geinitz's figure, while the succ verticils on the same stem at the bases of the branches prese usual form. It is probable that the leaves of the verticils at the of branches in the larger stems tend to the lanceolate or ta form. The form which Stur differentiates as *Annularia sarep* may be comparable to the variety of *Annularia sphenophylloi* scribed by Lesquereux as *intermedia*.[1]

Fructification.—Branches of *Annularia sphenophylloides* wit strobiles attached were first made known by Sterzel,[2] who illus some specimens from the coal field of Saxony. In the large sp figured the strobili are situated opposite, or possibly in whorls, from the verticillated joints at nearly right angles in the same as the sterile branches. The same branch bears typical verti *Annularia sphenophylloides* (*Annularia brevifolia* of Stur). The s differ from those of *Annularia stellata* chiefly by their shortne rather smaller diameter. The sterile bracts taper from the base ing upward and curving close about the sporangia, which are se tween, nearly equaling the internodes in length. The internode the sporangia in place present a globular appearance, while the are seen under the lens to be transversely corrugated. Sterz Zeiller consider these strobiles as identical with those minutely des by Weiss as *Stachannularia calathifera*, a correlation hardly ac by the latter author, although admitted as possible.

Relations.—Among the species of its size it is easily disting from both *Annularia microphylla* Sauveur (nec Roemer) and *Ann Emersoni* Lx., by its wedge-shaped spatulate leaves, while, unli latter, it has a strong median nerve. Several authors have em Brongniart's name, *Annularia brevifolia*, as having priority (182

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[1] Coal Flora, vol. III, p. 724.

[2] Zeitschr. d. deutsch. geol. Gesell., XXXIV, 1882, p. 685.

sphenophylloides (1833), changed by Gutbier to *Annu-* ongniart had defined his species. But as Brongniart ed, figured, nor made reference to any description or nly agree with Zeiller that his name can not stand. Clelland's shaft, near Belleville; and Hannam's shaft,

PHENOPHYLLUM Brongniart. 1822.

he relations of the genus *Sphenophyllum*, which for a century has been the subject of discussions, from of view, in which a large number of paleontologists ave taken part, a strong disagreement still prevails. ress made in studying the internal structure of the lora, with its attending startling and revolutionary strongly affected the classification of many of the s, including the *Sphenophylla*. The general characters structure of *Sphenophyllum* have been described by As to matters of detail and interpretation there yet ifference of opinion. In their general structure they mediate between the *Calamariæ* and the Carboniferous Renault, whose extensive researches in the internal coal measure flora is of the highest value, refers the *iizocarpeæ*, on account of its organization, foliage, and iich he considers to be heterosporous. Zeiller considers ily, midway between the *Calamites* on the one hand *lendra* and *Sigillariæ* on the other. Schenk and Van t as standing nearest to the *Lycopodiaceæ* by reason of nd the position of the sporangia on the spike, while distinguished present representative of a succession histologists, insists on its affinities to and union with of the *Calamariæ* through its intimate relations, as he , with the *Asterophyllites*. Going still further, Stur, dimorphism appearing among the living *Equiseta*, *phyllum* as the heteromorphous macrospore-bearing *Calamites*, the *Asterophyllites* being the homomorphic

ity of the ribs, without alternation at the joints, *Sphe-* ibles *Bornia*, the prototype of the calamarian family; lency to continuity in the ribs and furrows appears in *er* and others of the older species of this genus. The ne nerves also has its prototype in the same genus, as intly described and illustrated by Stur from excellent Culm flora. Its articulated stems, with furrows and uri-nerved leaves in verticils at the joints, remove it

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[1] Isis v. Oken, 1837, col. 436.

from the Lycopodiaceæ and bring it closer to the *Calamariæ.* searches and illustrations of Newberry, Zeiller, and Stur sh dency of the leaves in parts of *Sphenophylla* to simulate *Astero*

Its structure, which is somewhat related to that seen in son described as *Asterophyllites*, presents hardly greater differen these than are found in the organization in the many type *Calamariæ.* Zeiller and Stur find the bracts of some *Sphen* *strobili* bifurcated like the leaves of some *Volkmanniæ.* Font White described their *Sphenophyllum latifolium* as having th united at the base. Stur, in his magnificent work on the S *Calamariæ* insists that indisputable specimens of *Sphenophyllu* he figures, were the branches of large stems of a type that ha ally been described as *Calamites.*

In their atlas of the Carboniferous Flora of Commentry, P text for which I have not seen, Renault and Zeiller illust *Sphenophyllum oblongifolium* Germ., two branches of foliate bearing stems of *Sphenophyllum* several centimeters long and a wide, at whose joints, 10–12^{mm} apart, are found sheaths. These which are found only on the main stems, are dissected near base into many slender, linear, acute teeth nearly 1^{cm} in leng straight, some arching slightly inward, some outward, all incl narrow angle of divergence from the stem.

For the reasons suggested above it may be excusable, at pr regard *Sphenophyllum* as descended from a *Bornia* or *Archæo* stock, in common with the rest of the calamitean family, to foliar members have the closest affinities through the Volk and asterophyllitean types, while the trunks of the larger sp be found, I anticipate, to have been referred by various author family under the names *Calamites*, *Macrostachya*, or, perha properly, to *Calamitina.*

SPHENOPHYLLUM CUNEIFOLIUM (Sternb.) Zeill.

1823. *Rotularia asplenioides* Sternberg, Versuch, I, fasc. 2, p. 30; Pl. XXVI, F
1823. *Rotularia cuneifolia* Sternberg, op. cit., I, fasc. 2, p. 33; Pl. XXVI, Fi
1826. *Rotularia pusilla* Sternberg, op. cit., I, fasc. 4, Tent., p. xxxii.
1828. *Sphenophyllum dentatum* Brongniart, Prodrome, p. 68. 1850: Ung Species, p. 70. 1855: Phillips, Man. Geol., p. 234, Fig. 110.
1831. *Sphenophyllum erosum* Lindley and Hutton, Foss. Fl., I, Pl. XIII. 1 bury, Quart. Jour. Geol. Soc. London, III, p. 430, Pl. XXIII, Fi 1864: Coemans and Kickx, Monogr. Sphen., p. 149; Pl. I, Figs. 5a, Schimper, Traité, I, p. 341. 1869: von Roehl, Foss. Fl. Steink. We p. 30; Pl. IV, Fig. 19. 1869: Dawson, Acadian Geol., 3d Ed., p. 444, 1880: Lesquereux, Coal Flora, I, p. 55. 1881: Weiss, Aus d. Fl. Stei Figs. 57, 57a. 1887: Lesquereux, Proc. U. S. Nat. Mus., X, p. 23. 1 son, Geol. Hist. Pl., p. 122, Fig. 45c. 1891: Newberry, Jour. Cinci Nat. Hist., XIII, p. 215, Pl. XIX, Fig. 1.

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[1] Pl. L, Figs. 1, 2.

um erosum var. *saxifragæfolium* Schimper, Traité, I, p. 342; Pl. xxv,
1–14.
osa (L. & H.) Goeppert, Foss. Farrnkräuter, p. 431.
um pusillum (Sternb.) Sauveur, Vég. foss. terr. houill. Belg., Pl.
. 4.
um Schlotheimii var. *β dentatum* et var. *ζ erosum* von Ettingshausen,
adnitz, p. 30; Pl. xi, Figs. 1–3.
um dichotomum (Germ. et Kaulf.) Ung., Stur, Culm-Flora, II, p. 119
37: Carb.-Fl. Schatzlarer Sch., II, p. 233, f. 43; Pl. xv, Figs. 5a, b,
b, Fig. 2.
um cuneifolium (Sternb.) Zeiller, Vég. terr. houill., p. 30, Pl. clxi,
82: Renault, Cours bot. foss., II, p. 87, Pl. xiii, Fig. 10. 1882: Zeiller,
. géol. Nord. II, No. 2, p. 559. 1886: Kidston, Cat. Pal. Foss. Pl.
., p. 48. 1886: Zeiller, Fl. foss. Valenciennes, atlas, Pl. lxiii, Figs.
Fruit, Pl. lxiii, Figs. 3, 4, 5, 10) text (1888), p. 413. 1888: Howse,
on Collect., p. 37 (52).
um emarginatum, Sterzel, Fl. Rothl. n.-w. Sachsen, p. 23 (pars).

Forma [var?] Saxifragæfolium Sternb.

lyphylla Sternberg, Versuch, I, fasc. 4, p. 42, Tent., p. xxxii, Pl. l,

um fimbriatum Brongniart, Prodrome, p. 68.
um saxifragæfolium (Sternb.) Goeppert in Bronn, Index Pal., I, p.
4: Geinitz, Fl. Hain. Ebersdorf., p. 37, Pl. xiv, Fig. 7–10. 1869: von
ss. Fl. Steink. Westphalens, p. 31, Pl. iv, Fig. 17. 1878: Zeiller,
terr. houill., atlas, Pl. clxi, Figs. 4, 5, text (1879), p. 31.
um multifidum Sauveur, Vég. foss. terr. houill. Belg., Pl. lxiv, Figs.

um Schlotheimii var. *β dentatum* et var. *ζ erosum*, Ettingshausen,
enfl. Stradonitz, p. 6, Pl. vi, Fig. 6.
um trifoliatum Lesquereux, Bost. Jour. Nat. Hist., VI, No. 4, p.
: Lesquereux, Geol. Penn., II, p. 853, Pl. i, Fig. 7. 1880: Fontaine
White, Permian Flora, p. 20.
um Schlotheimii Brongn., Geinitz, Verst. Steink. Sachsens, Pl. xx,

m emarginatum Brongn. var. *β saxifragæfolium*, O. Feistmantel,
am. Ablag., I, p. 134, Pl. xviii, Fig. 4.
m erosum L. & H., Newberry, Jour. Cincinnati Soc. Nat. Hist.,
15, Pl. xix, Figs. 2–4.
m erosum L. & H., var. *saxifragæfolium*, Coemans and Kickx,
gen. Sphenophyllum, p. 151, Pl. i, Fig. 6 a–d. 1880: Schimper, in
ndb. Palæont., II, p. 179, Fig. 135 ^{3}, ^{4}.
m cuneifolium var. *saxifragæfolium*, Zeiller, Fl. foss. houill. Valen-
tlas, Pl. lxii, Fig. 1; Pl. lxiii, Figs. 4, 5, 9, 10; text (1888), p. 413.

ches isolated on the larger stems, 1–3$^{\rm mm}$ wide, rather
, nodes at intervals of 5–14$^{\rm mm}$, slightly enlarged, verti-
the leaves generally turned towards the sides and lower
cle, leaves usually six to the verticil, or 12 by division,
cuneiform, 6–12$^{\rm mm}$ long, the lateral margins straight or
e, apices truncate, about 4$^{\rm mm}$ wide, the border straight,
ly pointed teeth, or more often cleft by a shallow median
laciniate; a single nerve at the base, strong, dichotomiz-
ur times in the entire or bilobate leaves, to form 6–14
pex, each nervil entering a tooth, or forking only two or
the bifurcate or laciniate leaves.
xes terminal on the branches, cylindrical, 3–10$^{\rm cm}$ long,

5–12$^{\text{mm}}$ in diameter, consisting of an axis 1–2$^{\text{mm}}$ thick divided
ternodes 2–3$^{\text{mm}}$ long, with low ribs, and bearing at each node a
of sporangiferous bracts 5–10$^{\text{mm}}$ long, open at the base, then
upwards more or less abruptly, sometimes rather crowded,
twelve bracts to the verticil, perhaps united at the base, bifurc
a distance of 1–2$^{\text{mm}}$ from the base, into two lanceolate, uniner
inæ tapering to a sharp point, those of one verticil overlappi
of the next above, each bract bearing an ovoid sporangium
long, with surface finely shagreened, attached at a distance
from the axis and crowded together.

Sphenophyllum cuneifolium is another of the great number of
iferous plants whose description is limited chiefly to foliar cha
and whose lower parts are unknown. Zeiller, to whose zeal w
debted for the discovery of its fructification, describes the larg
as attaining a width of 1$^{\text{cm}}$ with internodes as long as 3$^{\text{cm}}$, sn
faintly striate. I have not seen leaf-bearing fragments of ste
than 3$^{\text{mm}}$ wide, although much larger fragments, apparently be
to the same species, are present. The average smaller bran
about 1$^{\text{mm}}$ in width, strongly ribbed, usually exhibiting three
ribs on the side, the furrows between them having the same sh
size as the ribs, the whole covered with a thin coaly substanc
striated. The nodes, usually 9–11$^{\text{mm}}$ apart, are but slightly e
the base of the verticils appearing to form a small cup, or po
sheath at the joint, before they spread outward. The leaves, a
6 in the verticil, are, in most cases, with a shallow median fissur
1½–2½$^{\text{mm}}$ deep, but many have none. I have observed verticils
leaves succeeding others with bilobate leaves on the same branch
entire or simply bilobate leaves are generally 9–11$^{\text{mm}}$ long and ab
broad at the truncate top. The teeth are pointed at the tip.
leaves the basal nerve branches two or three times, its distinct
running into the teeth, which more often number 7 to each of
lobes of the leaf. In the best preserved specimens, in whic
nerves appear black and coaly, the upper surface of the leaf pr
minutely striated appearance, the filamentary lines running in
tion conforming to the nervation. As they seem to cover th
veins as well as the dark brown substance of the leaves, they
represent the arrangement of the epidermal cells, or possibly
scales. Very often the median cleft extends half way or mo
the leaf, in which cases secondary and even tertiary fissures
giving the leaves a wide range of forms including a number t
been described and figured as *Sphenophyllum saxifragæfolium*.
may take a twice bifurcated form, similar to that described by
reux as *Sphenophyllum bifurcatum*, only smaller than that specie
of the primary divisions may be tridentate, one tooth deeply se
from the rest, or the leaves may become laciniate or nearly fi
While I am strongly inclined to believe that certain forms, not
ing to this species, have been described as *Sphenophyllum saxi*
lium, it seems equally probable that to the latter species have

many specimens of the more dissected leaves of *Spheno-*
folium. The frequent and intimate association of these
entire or bilobate forms in a large number of localities
ed out by several authors and has led these authors to
enophyllum saxifragæfolium as only a variety of *Spheno-*
folium. Whatever the propriety of such a reference of
definitely correlated with the *Sphenophyllum cuneifolium*
ion of some to the *saxifragæfolium* forms is so intimate
with the *cuneifolium* type, occasionally appearing in the
the same stem, that there seems no good reason for re-
to a variety at all, but rather it is probable that they
ent the lower or submerged leaves of the same plant.
the relations of the filiform or *saxifragæfolium* leaves,
by Dr. J. S. Newberry in 1853[1], and independently pro-
ans and Kickx,[2] in 1864, has recently been more fully
l illustrated by Dr. Newberry.[3] The illustrations cited
fragæfolium in the above synonymy are such as seem to
forms in the present collection.[4] Frequent among my
examples resembling *Sphenophyllum bifurcatum,* though
and certain laciniate palmatifid forms like those figured
he flora of the Valenciennes basin.[5] Although Zeiller
llustrates[6] *saxifragæfolium* forms on the same stems with
lum cuneifolium and doubts not the identity of the two to
he is disposed to preserve the name as a variety for the
e fruiting spikes are found at the ends of branches with
oliate leaves, a circumstance at variance with the theory
ged condition of life of the portions of the plant with the
s. The fruiting spikes figured in the Commentry Flora,
e above description of the fructification is taken, are
ively robust stems, measuring $2–3^{mm}$ in diameter, with
^{m} long. It is noticeable in the foliar parts of this species
ns bearing the dissected leaves generally show a short-
ints, while the stems are stouter, as would be natural in
s of the same plant. The relation appears in the fruiting
. A possible explanation suggesting itself is that the
deeply dissected foliage is also characteristic of the fer-
which approach, in their development, the two-lobed,
e bracts of the strobili.

n.—A fine series of strobili in different stages of devel-

Adv. Sci., VII, p. 157; Annals of Science, I, Cleveland, 1853, p. 269.
Sphenophyllum d'Europe. Bull. Acad. Roy. d. Belgique, 2e sér. XVIII, p. 139.
ophyllum. Jour. Cincinnati Soc. Nat. Hist., XIII, 1891, pp. 212–217, Pl. XIX.
m saxifragæfolium Germ. described by Lesquereux in the third volume of the
l. XCIII, Figs. 9, 9a, with "about four" primary nerves, "some of them forking
quite different from those referred to above under that name. As yet, however,
either to consult the original specimen nor find another corresponding to its de-
ation from the same region.
uill. d. Valenciennes, Atlas, 1886, Pl. LXIII, Figs. 4, 8, 8a, 8b, 9, 9a, 9b.
Fig. 1. See also Bunbury, Quart. Jour. Geol. Soc., London, III, 1847, Pl. XXIII,

opment has been examined by Zeiller, who describes the bracts of t spikes as two-lobed, quite narrow at the base, broadening to the p where they curve upward, then tapering to a sharp point. These pear to be slightly united at the base, and it is not certain that th are not so united. The sporangia, equaling the lobes of the bracts number, are borne on the bract, at some distance from the axis, a are marked at the lower end, the point of attachment, by a small c cular umbilical depression. The mode of discharging the spores unknown.

Relations.—*Sphenophyllum cuneifolium* can most easily be disti guished from *Sphenophyllum Schlotheimii* by its narrower proportio and truncate apex, provided with sharp-pointed teeth. It has mo and sharper teeth than *Sphenophyllum emarginatum*, whose teeth a short and rounded, and whose leaves do not pass into the dissect forms common to this species. *Sphenophyllum majus*, which it rese bles in many respects, is very much larger, while the leaves *Sphenophollum oblongifolium* have their lateral margins convex i stead of straight, or more often concave, as is the case with *Sphe phyllum cuneifolium.* Zeiller, to whose valuable services in beh of paleobotanical nomenclature I have already made allusion, h with good reason adopted Sternberg's name, *cuneifolium.* This speci first called by Sternberg *Rotularia asplenioides*, was changed[1] in t same fascicle, appearing in the same date, to *Rotularia cuneifol* Three years later he proposed the name *Rotularia pusilla.*[2] The e nent French paleobotanist, while admitting the author's right change the name from *asplenioides* to *cuneifolium* in the same part, a pearing at the same time, justly insists that Sternberg has no furth right to change it after the fascicle had been published and was in u All three of Sternberg's names are obviously prior to *Sphenophyll erosum* L. & H., which has generally been employed.

Locality.—Abundant in the shales from McClelland's shaft; al found at Aurora, Lawrence county.

SPHENOPHYLLUM MAJUS Bronn.

1828. *Rotularia major* Bronn, in Bischoff, Kryptogamischen Gewächse, II, p. 89 (d scribed in footnote); Pl. XIII, Fig. 2a, b.

1835. *Sphenophyllum majus* Bronn, Lethæa geognost., p. 32, Pl. VIII, Figs. 9a, 9b. 18 Zeiller, Fl. foss. Valenciennes, atlas, Pl. LXIV, Figs. 1, 1a, 2, 2a, text (18 p. 420.

1848. *Sphenophyllum multifidum* Sauveur, Vég. foss. terr. houill. Belgique, Pl. LXI Figs. 1, 2.

1855. *Sphenophyllum longifolium* (Germ.) Gein. et Gutb. (non Sauveur), Geinit Verst. Steink. Sachsens, p. 13, Pl. XX, Figs. 15, 16, 17. 1860: Lesquereux, Rept. Geol. Surv. Ark., p. 315. 1869: Schimper, Traité, I, p. 340, Pl. XX Fig. 22 (non 23). 1880: Fontaine and I. C. White, Permian Flora, p. 1880: Lesquereux, Coal Flora, I, p. 53. 1883: Lesquereux, 13th Ann. Rep Geol. Surv. Ind., pt. 2, p. 46, Pl. VII, Figs. 10, 11. 1884: Lesquereux, A Nat., XVIII, p. 923. 1884: Lesquereux, Coal Flora, III, p. 726, Pl. XCI, Fi 6. 1891: Newberry, Jour. Cincinnati Soc. Nat. Hist., XIII, p. 215.

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[1] Versuch, I, fasc. 2, 1823, p. 37.

[2] Op. cit., fasc. 4, 1826, Tent., p. xxxii.

hyllum saxifragæfolium, Geinitz, Verst. Steink. Sachsens, p. 13,
igs. 8, 9.

um latifolium Wood (nec Font. et White, necque Ren. et Zeill.),
n. Phil. Soc., XIII, p. 347, Pl. VIII, Fig. 3.

robust, with prominent, rather angular, ribs; nodes at
3cm ; joints slightly enlarged ; branches solitary at the
–2½mm wide, with articulations 12–26mm apart ; verticils
wedge-shaped leaves, open, with straight lateral margins,
4mm long or perhaps longer, usually bifid by a shallow
ometimes with a secondary fissure less deep, but occa-
cleft, more or less distinctly dentate, the teeth more or
parted in acuminate laciniæ; nerves strong, two at base,
otomously to form from fourteen to twenty-four nervils,
ny teeth.

lescription is based exclusively on the features seen in
nich the specimens before us belong. These characters
rporated into the diagnoses of *Sphenophyllum longifolium*
t Gutb., and *Sphenophyllum majus* Bronn. Judging from
rsity in the features of the plants described under these
lly as seen in the leaves, ranging from 12mm to 6cm with
to two at the base, or not confluent at all, according to
uthors, one must conclude either that this is a very
ecies in itself or that two or more distinct types have
nder one name. Most authors have either ignored the
hyllum majus, or have made it a synonym of *Sphenophyl-*
. The result is the description of a variety of forms
Sphenophyllum longifolium, of which too few have been
scribed in detail to permit either a satisfactory union or
among them. I employ Bronn's name because it has
ecause his description and figure agree more nearly with
in hand. *Sphenophyllum longifolium*, as described and
mar[1] has its leaves usually 2–3cm long, while the nerves
otomize two or three times from four nerves distinct at
ny of the other characters agree. The plants figured by
mans and Kickx,[3] Weiss,[4] von Roehl,[5] Renault,[6] Renault
nd the very doubtful leaves referred by Heer[8] to that
a Noeggerathian appearance, the leaves long, the nerves
t the base, and forking but two or three times. Those
nitz[9] have a closer resemblance to our American species.
onsisting of detached portions of stems and foliage are
all through the shales in the collection. The branches,

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col. 426. Foss. Fl. Steink, Wettin u. Löbejün, 1845, p. 17, Pl. VII, Fig. 2.
340, Pl. XXV, Fig. 23 (copied from Germar).
ophyllum, Bull. Acad. Roy. Belg., 2e sér. XVIII, 1869, p. 147, Pl. I, Fig. 4.
teinkohlenform, 1881, Pl. X, Fig. 60.
'orm. Westphalens, 1869, p. 31, Pl. IV, Fig. 14.
année, 1882, p. 88, Pl. XIII Fig. 18 (from Coemans and Kickx).
ill. Commentry, Fl. fossile, pt. 2, Pl. L, Figs. 12–17.
, 1877, No. 1, Beiträge zur fossilen Flora Spitzbergens, p. 15, Pl. II, Fig.

hsens, 1855, Pl. XX, Figs. 15–17.

scarcely enlarged at the joints, are marked with three round The verticils almost invariably contain six leaves, often spr in a circle, though more generally confined to the lower thre rants. Occasionally in the smaller branches the verticils overla one-half their diameter. The leaves are very slender at their ment and are fixed at an oblique angle to the branch, but c ruptly outward about 1^{mm} from the base, so that the specimen fre presents a round pit at the center of the verticil. The averag of the leaves is about 19^{mm}, the width of the top being general 11^{mm}. The fissure, usually present at the top, is normally abou deep, though much deeper in the laciniate leaves. The nerves are strong, forking three to five times, often appear to coale single nerve for a short distance in the slender neck of the l they apparently only lie side by side, the vascular bundles of maining separate, while immediately above the point of atta they are seen, in some cases at least, to diverge suddenly, th the right, the other to the left, to join the vascular system of the In a few cases the circumstances of fossilization are such that the fine black vascular bundles seen running along the ribs branch is observed to pass up into the leaf. In the middle thir leaf, in the best preserved specimens, the nerves occasionally double, their borders being marked by two coaly lines. The l leaves of this species are not rare, though I have seen none large proportions of one of the specimens described by Lesque the Coal Flora,[1] or that figured in his Paleozoic Flora[2] as *phyllum longifolium*. The other specimens figured by Lesque the latter work,[3] and in the third volume of the Coal Flora the same name, as well as those described in detail and illustr Zeiller,[5] under Bronn's name, agree well with mine. To this probably belongs also *Sphenophyllum latifolium* Wood, describe Transactions of the American Philosophical Society.[6]

Relations.—The relations of *Sphenophyllum majus* Bronn to *ophyllum longifolium* (Germ.) Gein. et Gutb. are not clear, sin does not seem to be sufficient data either for absolutely comb definitely distinguishing the forms described under these From *Sphenophyllum cuneifolium* the species is easily separate greater size, the two nerves not united at the base and th numerous, generally blunter, teeth. It differs by its proport narrower leaves, usually bifid and distinct to their bases, f palmately nerved *Sphenophyllum latifolium*, described by Fonta I. C. White (non Wood) in their Permian Flora,[7] as well as f

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[1] Vol. I, p. 54.

[2] 13th Ann. Rept. State Geologist, Indiana, 1883, Pt. 2, Pl. VII, Fig. 11.

[3] Op. cit., Fig. 10.

[4] Pl. XCI, Fig. 6.

[5] Fl. foss. bassin houill. Valenciennes, p. 420, Pl. LXIV, Figs. 1, 1a, 2, 2a.

[6] Vol. XIII, 1866, p. 347, Pl. VIII, Fig. 3.

[7] 2d Geol. Surv. Penn., Report "PP," 1880, p. 36. Pl. I, Figs. 10, 11.

resembling the latter, named *Sphenophyllum latifolium*
Zeiller (non Font. et White, nec Wood), and figured
the Fossil Flora of Commentry.[1] .
attered all through the shales from McClelland's shaft;
annam's shaft, near Carterville.

PINNULARIA Lindley & Hutton. 1834.

HYDATICA Artis. 1825.

apillacea Lindley and Hutton, Fossil Flora, II, p. 81; Pl. CXI. 1855:
erst. Steink. Sachsens, p. 10; Pl. XVIII, Fig. 4. 1858: Lesquereux,
., II, p. 878; Pl. XVII, Fig. 22. 1869: Von Roehl, Foss. Fl. Steink.
us, p. 27; Pl. I, Fig. 7 *b*; Pl. II, Fig. 5 *a*; Pl. IV, Fig. 11. 1873: O.
el, Steink. u. Permabl. n.-w. Prag, p. 72, Pl. I, Fig. 2.
innata Lesquereux, Bost. Jour. Nat. Hist., VI, No. 4, p. 431. 1858:
., II, p. 878; Pl. XVII, Fig. 18.
ucoides Lesquereux, Bost. Jour. Nat. Hist., VI, No. 4, p. 431. 1858:
x, Geol. Penn., II, p. 878; Pl. XVII, Fig. 19.
orizontalis Lesquereux, Bost. Jour. Nat. Hist., VI, No. 4, p, 431.
. Penn., II, p. 878; Pl. XVII, Fig. 21 (also Figs. 15, 16, same plate).

known as *Pinnularia* are believed to belong for the most
amariæ, and particularly to *Annularia* and *Asterophyl-*
, the rootlets of widely different forms of plants often
alike that the differentiation of the species is of little
ereux himself suggested in 1858. Since, nevertheless,
ppearing rootlets are probably destined in the future, as
in the past, to be called by some name, it would per-
ore proper to call them *Hydatica*, the name proposed
tis in 1825, rather than to continue the application of
n's name, *Pinnularia*, proposed in 1834, which was pre-
g been proposed four years earlier by Ehrenberg[2] for a
s, many of whose representatives are found fossil.
Clelland's shaft.

FILICINEÆ.

SPHENOPTERIDEÆ.

DIPLOTHMEMÆ.

iplothmemæ as founded by Stur (1877) and emended by
ncludes ferns whose fronds are composed of a more or
ked axis bearing alternating naked branches, each of
izes at the top into either (1) two divergent foliate pinnæ;
t naked branches, each branch forking at a short dis-
gin into two divergent slightly unequal fronds. Accord-
division and restriction of Stur's original genus *Dip-*
ame is retained for the first section, characterized by a
primary pinnæ into two divergent sections regularly

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[1] , 9 (changed to *S. alatifolium* in text, p. 487).

[2] rt in Bronn: Index Palæont. See Monatsber. Berlin. Akad., 1843, p. 62.

pinnate, bipinnate, or tripinnate, bearing sphenopteroid pinnule
are contracted at the base, with the margin more or less deeply
lobed, or denticulate.

The second section, with quadripartite primary pinnæ, the four d
of which are regularly simple or more often bipinnate or tripinna
pecopteroid pinnules attached to the rachis by their entire bas
somewhat decurrent toward the base and more or less unit
stitutes the genus *Mariopteris* of Zeiller. In this genus the ou
næ, with reference to the bifurcation, are described as rather
than the others, the laminæ well developed with the margins e
feebly lobed or dentate, the median nerve usually distinct and
almost to the summit, the nervils generally oblique, dichotomi
very narrow angles, some of them in the lower part of the p
springing directly from the rachis.

While the bifurcation of the rachis constitutes a salient dis
character, indicating the relationship of the species in a natura
it is, from the very mode of occurrence and exploitation of fossil
relatively rarely possible to observe the union of the division
fronds or even such fragments as to furnish positive proof as t
genus the species belongs. Accordingly, although the genera
haps distinct enough, it is, in practice, when dealing with each
often impossible to tell to which of the genera it belongs. M
several species, the details of whose foliage indicate an identi
one genus, are found, on the strength of the rachial charac
belong to the other. In working, the reference of a species t
genus must therefore be necessarily often uncertain and g
largely by its affinities. The discovery of the fructification wil
less show the present generic divisions of the groups to be qu
ficial, though temporarily convenient.

Dr. Stur is disposed to consider the axis of the *Diplothme*
cribed above, as a stem and the branches as alternate or
arranged petioles bearing bipartite fronds, comparing the latt
those of *Acrostichum* (*Rhipidopteris*) *peltatum*. Zeiller and Cr
the other hand, regard them as having rather the habitat of *Ly*

DIPLOTHMEMA Stur. 1877.

DIPLOTHMEMA GENICULATUM (Germ. et Kaulf.) Stur.

Pl. I, Figs. 1, 1*a*, 2, 2*a*.

1831. *Sphenopteris geniculata* Germar und Kaulfuss, Nova Acta Acad. C.
cur., XV, pt. 2, p. 224; Pl. LXV, Fig. 2. 1836: Goeppert, Systema
1833: Sternberg, Versuch, II, fasc. 5 u. 6, p. 61. 1887: Kidston,
Series, p. 346; Pl. XXI, Fig. 1.

1836. *Trichomanites Kaulfussii* Goeppert, Systema, p. 264.

1869. *Sphenopteris* (*Trichomanides*) *Kaulfussii* (Goepp.) Schimper, Traité, I,

1877. *Diplothmema* (*Sphenopteris*) *geniculatum* (Germ. et Kaulf.) Stur, Cul
p. 124 (230).

1885. *Diplothmema geniculatum* (Germ. et Kaulf.) Stur, Carbon-Fl. d. Sc
Sch., I, p. 297, Pl. XXXV, Fig. 1.

ated into two unequal divisions above a naked axis,
primary pinna ovate or triangular, acute; primary
ete flexuose-geniculate, bordered by narrow laminæ;
alternate, at right angles to the rachis or oblique,
ary divisions or pinnules alternate, the lower ones
iate, the upper ones diminishing by fewer laciniæ,
innately dissected; laciniæ equal, sometimes forking,
h segment traversed by a single nerve.

ies is represented by five specimens, all showing the
ered rachis, and the peculiar delicate subpalmately
s, whose form, size, and arrangement are especially
The rachises of the secondary pinnæ are less genicu-
of the primary pinnæ, and are bordered by a narrow
distinctly seen decurring from and uniting the con-
cellate pinnules. The latter are rather distant and
overlapping, the lowest ones nearly at right angles to
ipper ones becoming more oblique. The larger pin-
first glance, palmatifid, but the mode of division is
otomous or divaricate, as is seen in those higher up
e latter becoming more elongated, with fewer laciniæ,
forking in the upper pinnules. A good indication of
e pinnules is seen in Pl. I, Fig. 2, the larger figures
e true aspect of the arrangement of the segments and
r the apex of the pinnæ the pinnules become merely
mple. While the laciniæ or ultimate segments vary
e pinnules, they are, relatively, of nearly uniform size
e frond, the larger ones averaging about 4^{mm} in length
ver $\frac{1}{2}^{m}$ in width. The nervation is fairly clear. The
smallest pinnæ are rounded and generally slightly de-
junction with the larger rachis.

in hand agree well with the figures given by Kidston
flora[1] and Fig. 1 on Pl. XXXV of Stur's Schatzlar ferns,[2]
he original illustration by Germar and Kaulfuss.[3] As
figured by Stur, Fig. 1, Pl. XXVIII in the above-men-
some of those published by Heer,[4] I am inclined to
lston, that they may belong to *Diplothmema furcatum*
bifida L. & H., respectively, while the other fragment
under this name seems possibly referable to *Diploth-*
itum.

plothmema geniculatum is said to differ from *D. sub-*
he smaller size, the more divided fronds, and the more

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inb., XXXIII, 1887, Pl. XXI, Figs. 1, 1a, 1b, p. 346.
larer Sch., p. 297.
würdige Pflanzenabdrücke aus der Steinkohlenformation. Nova Acta Acad.
XV, pt. 2, 1831, p. 224, Pl. LXV, Fig. 2.
IV, No. 1, Pl. I, Figs. 7, 8, 10.

slender laciniæ of the latter.[1] *Diplothmema furcatum* is consi
larger than *Diplothmema geniculatum*, the frond more divided, t
nules spreading farther, and the laminæ broader and much m
tuse. From *Sphenopteris lanceolata* it differs by its strongly fl
or geniculate rachis, much more slender, its foliage very much t
its pinnules not appearing pinnately divided, its lobes not sho
obtuse, while it is quite easily distinguished from *Sphenopteris*
manoides by its subpalmately divided pinnules, which have un
longer lobes, obtusely rounded at the apex. So far as known, *S*
teris Hildreti has its rachis not geniculate, the pinnules elongat
pearing pinnately divided, the lobes proportionately longer.

Locality.—McClelland's shaft.

MARIOPTERIS Zeiller. 1878.

MARIOPTERIS (PSEUDOPECOPTERIS)[2] MAZONIANA Lx. s

1870. *Alethopteris mazoniana* Lesquereux, Geol. Surv. Ill., IV, p. 391, Pl. IX, F
Pl. XIII, Figs. 5, 6.

1879. *Pseudopecopteris mazoniana* Lesquereux, Coal Flora, atlas, Pl. XXXII, F
text (1880), I, p. 190.

Fronds pinnately divided in the lower part, dichotomous at th
primary rachis striate, canaliculate, flat on the borders; sec
pinnæ either long, sublinear, gradually tapering to the apex, or
more distinctly linear, obtuse, pinnately lobed; pinnules alt
slightly distant, constricted at the base in the lower part of the
decurrent, bordering the rachis with a lamina, coriaceous;
nerve rather strong, thinning upwards, depressed, decurrent,
nearly to the apex of the pinnule; secondary nerves oblique,
parallel, forking below the middle.

The above description, based upon that given in the Coal
seems to include the characters of our fragments, and I have r
them, with but little doubt, to *Mariopteris mazoniana*, all th

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[1] I have seen no genuine specimens of *D. subgeniculatum*, the only specimen from our
ures ever identified by that name, I believe, having proved on examination to be, as was sug
Lesquereux himself (Proc. U. S. Nat. Mus., vol. XI, 1888, p. 84), only a portion of a steril
Sphenopteris Harveyi, with which it was associated. The latter species, according to Lesqu
Kidston (Cat. Pal. Pl. Brit. Mus., p. 250), is probably identical with *Zeilleria delicatula* (Stern
(Quart. Jour. Geol. Soc. London, vol. XL, 1884, p. 592, Pl. XXV.)

[2] The name *Pseudopecopteris*, applied by Lesquereux to a restricted portion of the genu
mema, as originally proposed by Stur, including those forms of *Pecopteris* and certain
nuled species of *Sphenopteris* with dichotomous rachises, usually bordered near the top by
lamina from the decurrent pinnules, was proposed without knowledge of Zeiller's genus *M*
founded in 1879 to contain essentially the same group of species. Inasmuch as *Mariopt*
nally defined, probably includes most of the forms referred by Lesquereux to *Pseudopecopt*
priority over the latter name, which I have, however, included as more familiar to Ameri
gists. *Mariopteris* is described in Bull. Soc. géol., France, 3^e sér., VII, 1878-'79, p. 93; Fl. foss. te
1879, p. 68; Fl. foss. houill. Valenciennes, p. 159. The peculiar quadripinnate structure of th
was first made the basis for a generic separation by Ad. Brongniart, who gave the specim
Muséum d'histoire naturelle the manuscript name *Heteropteris*. Owing to the fact tha
specimens rarely show the dichotomous character of the plant, many species have been refe
group on account of their general resemblance to ascertained members of the group. As
differentiation it is doubtless somewhat artificial and may perhaps be found to contain seve
In assigning several species whose true generic characters have not, I believe, been obser
genus *Pseudopecopteris*, Lesquereux seems to have followed Stur, who originally included t
genus *Diplothmema*.

he types figured by Lesquereux in Pl. XXXII, Figs. 1 and
s are somewhat oblique to the rachis, generally ovate-
utline, the lower ones constricted to a narrow attach-
e, irregularly, but not deeply, lobate, especially on the
lowest lobe rather auricular, crenulate on the upper
esembling the pinnules of *Mariopteris speciosa* in the
of Pl. LI of the Coal Flora. Those higher in the pinna
ly lobed, becoming more deltoid, and attached by the
se near the apex being much smaller, rounded, gradually
l coalescing with the very small terminal pinnule. The
; and depressed, the secondary nerves are indistinct
parenchyma of the pinnule sometimes arches slightly
The surface of the pinnules is black and coaly, the
lightly curved backwards.

:riptions given by Lesquereux of specimens of *Pseudo-*
iana in his hands, as well as from the affinity of the
s probable that this species lies within the limits of the
ris.

[ariopteris mazoniana differs from all others by the
haracter of its pinnules, mingling pecopteroid and ale-
acters. The pecopteroid pinnæ, such as those repre-
resent collection, differ from the resemblant species,
folia and *Mariopteris speciosa*, by the size of the pin-
less deeply lobed. sometimes tending toward gemina-
es of the former species being much smaller and differ-
the median nerve thin, while the pinnules of the latter
, lobed near the tip, the nerves inflated and distinct.
:Clelland's shaft.

:ERIS (PSEUDOPECOPTERIS) DECIPIENS Lx. sp.

Pl. I, Figs. 5–8, 5*a*; Pl. II, Figs. 1–3, 3*a*.

decipiens Lesquereux, Bost. Jour. Nat. Hist., VI, No. 4, p. 420.
uereux, Geol. Penna., II, 2, p. 862; Pl. XVIII, Fig. 2. 1860: Les-
ept. Geol. Surv. Ark., II, p. 312, Pl. V, Figs. 1–1*a*. 1863: Dawson,
/III, p. 445. 1866: Dawson, Quart. Jour. Geol. Soc. London, XXII,

dilatata Lesquereux (non L. & H.), Rept. Geol. Surv. Ark., II,
, Pl. II, Figs. 3, 3a.

Aneimoides) decipiens Lx., Schimper, Traité, I, p. 401.
ris decipiens Lesquereux, Coal Flora, atlas, Pl. LII, Figs. 9?, 10,
1880), p. 214.
ris (*Sphenopteris*) *decipiens* Lx., Lesley, Dict. Foss. Penn. II, p, 798,

dichotomous below, tripinnate or quadripinnate, spread-
chis broad, flat, 2–7^{mm} or more in width, rather lax, some-
somewhat geniculate below, tapering rapidly toward
ılarly striate, punctate, covered in portions by a thin,

often shiny, epidermis, the upper portion bordered by narrow l
from the decurrent pinnules; primary pinnæ at right angles or o
toward the apex, oval-lanceolate, somewhat contracted below, ta
above to a slightly obtuse apex; secondary rachis rather lax, finely
tate, often flexuous, usually sulcate or depressed above, round
somewhat decurrent at the base; secondary pinnæ alternate, at
angles to the rachis, or oblique, the lower ones often curved bac
close, usually parallel, with margins close, generally touching or s
overlapping, 1½–6^{cm} or more in length, linear-lanceolate, 8^{mm}
wide, obtuse, terminating in large, broad sub-lobate, oval, ov
deltoid pinnules with sinuate margins and rounded tip; pinnules s
polymorphous, alternate, more or less oblique, close, generally
contiguous, sometimes slightly overlapping, thin, 3^{mm}–2^{cm} long,
broad, the lowest ones broader, oval, ovate, or obovate, sometimes
lar at the base of the pinnæ, occasionally oblong in the largest pinn
on the tip of the primary pinnæ, always rounded above, decurre
more or less connate by the decurrent laminæ, the margins u
slightly thickened and marked by a shallow furrow on the uppe
those toward the lower end of the larger pinnæ contracted at th
especially on the anterior margin, rounded below with a broad a
ment to the rachis, connate by a narrow, decurring lamina;
higher up in the pinna oval or obovate, curving outward, roun
the base above by a deep and narrow sinus, decurrent below;
still higher on the pinna not so deeply divided, becoming united
what below, and passing into the terminal pinnule, which is often
as broad as the pinna; pinnules of the upper secondary pinn
deeply separated, attached by the whole width; secondary pinn
ceeded, in passing toward the apex of the primary pinnæ, by pin
pinnules, lobed at the base, large oblong above, becoming enti
slightly sinuate margins in passing upwards, then entire, oblong,
or obovate, and with broadening attachments to the rachis, as
secondary pinnæ; lower pair of pinnules at the base of each sec
pinna usually shorter, more rounded at the base and broader tha
succeeding; the one on the upper side of the pinna more or less
ular or truncate above, the distal border often marked by a
shallow sinus or slight fissure in the more mature specimens; t
nule on the lower side more or less triangular or alate, the l
side, opposite the attachment, bilobate, more or less deeply cleft
more mature specimens, dividing the pinnule into two unequal lob
distal lobe usually longer and broader, the proximal lobe round
somewhat auriculate, or overlapping the rachis; pinnules of the
secondary pinnæ becoming oblong, with slightly undulate m
then lobed below, becoming, in passing downward, like those ne
tip of the primary pinnæ, gradually pinnatifid, the terminal p
long, broad, and obtuse, and assuming the forms and proportion
secondary pinnæ, the divisions corresponding to the lower bas
nule of the secondary pinnæ, shorter, with anomalous pinnatifi
sions diverging from the attachment of the original pinnule.

Nervation generally obscure, except in the lower part of the pi
primary nerves rather strong, diverging from the rachis usuall
very narrow angle and arching more or less gradually into the pi
giving off branches at a narrow angle during their passage, an
solving below the apex; primary bundles, often several, perhaps s
ing directly from the rachis in the smaller pinnules, and div
somewhat flabellately towards the margins, branching several
but only one becoming developed as a median nerve in each

constricted pinnules, in which it is strong, depressed,
ounctate below, diminishing above by finer branches,
and branching repeatedly in passing to the margin,
slender and slightly flexuous nervils count about thirty-
meter; nerves of the basal pinnules of the pinnæ more
e from the broad entering band of nerves at the base,
ssing, arched, to the lateral margins, nearly straight
; fructification unknown.

ribed above is represented by over seventy-five speci-
rving the same characters of pinnation and nervation.
ctive features are the obtuseness of the secondary pinnæ,
nd in large, broad, terminal pinnules, and the oblong,
oval lateral pinnules, always rounded above, not lobed,
se of the lowest pair of each pinna or the largest forms
tifid, when they are lobed at the base, and large oval
in Pl. 1, Fig. 7; the broadly, more or less distinctly
te form of the lower pair of pinnules, seen in Pl. 1, Figs.
lobe of the lower pinnule often elongated and rarely
lower lobe more or less auriculate, and overlapping
his; and the nervation, more or less flabellate from one,
incipal nerves diverging from the rachis by a curve,
t the base and diminishing in size and distinctness, so
are very fine, rarely becoming observable.

ns are preserved brown. The broad, flat rachises cov-
s, by a thin, somewhat shiny brown lamella and bor-
per part by a narrow, decurring wing, dichotomize be-
ting their position in the group *Mariopteris*. From the
he pinnules under the lens I suspect that they may be
cent. The presence of large fragments of rachis, over
similar to fragments seen with *Mariopteris muricata*
associated with the foliage of and probably belonging
nay be construed as indicating a very large size for the
ration of the larger oblong pinnules is much like that
ger pinnules of *Mariopteris* (*Pseudopecopteris*) *speciosa*
LI, Fig. 1*b*) except that the nerves are closer and the me-
olved sooner in larger branches.

r much hesitation that I refer our specimens to *Mariop-*
opteris) *decipiens*, a species which, to judge from the
l figures, is either extremely polymorphous or quite ill-
of the specimens described have the pinnules so oblong
seen in my specimens. The one figured in the Geology
a and copied by Lesley in the Dictionary of Fossils,
natifid pinnules, is lobed much higher and more irreg-
Missouri plant, as seen in Pl. I, Fig. 5, Pl. II, Fig. 2,
rving the tendency to a large broad terminal pinnule
f all my specimens. In the latter the nerves entering
requently not joined in one, like those of the Pennsyl-

vania specimen, which shows a tendency towards a subdivision of so
of the intermediate lobes. There is nothing in the collection clos
resembling the fragment figured in the Arkansas report[1] as *Sphen*
teris dilatata, later referred by Lesquereux in the Coal Flora[2]
Pseudopecopteris decipiens, nor the specimen[3] doubtfully included und
the latter name in the same work, while Fig. 10 of the atlas is in so
respects suggestive of the upper secondary pinnæ of the *Sphenopter*
Lesquereuxii of Newberry, illustrated in the Geology of Pennsylvani
regarded by Lesquereux as probably belonging to his *Pseudopecopter*
anceps. Fig. 10 differs somewhat from the Missouri plants by havi
its secondary pinnæ pinnatifid to the apex and terminating in a sm
round pinnule; by its shorter lateral divisions more truncate, and i
bricated, and the basal pinnules nearly like the others. The nervi
which are described as distinct, very different from my specimens, a
rather more distant, with less tendency to coalesce at the base, an
arch gently to the rachis. The *Sphenopteris decipiens* represented
the Arkansas Report[5] has more characters in common with the Misso
fern, though its pinnules are much more irregular, the nervils more d
tant, the apex of the pinnæ smaller and more deeply lobed, the p
mary rachis narrower, naked, and terete.

Through the courtesy of Mr. R. D. Lacoe, I have been able to e
amine a good specimen from his collection from Dade, Ga., identifie
by Professor Lesquereux as *Pseudopecopteris decipiens*. Its gener
aspect is much like that of the specimen figured in the Arkansas rep
last referred to, or to the Fig. 10 of the Coal Flora. In its dilated bas
and broad terminal pinnules it is closer to my specimens, though i
lateral pinnules are rather shorter, with their margins somewhat mo
arched, the nervation coarser and more distinct. Still more nearly fi
my material are two small fragments, No. 1037 of the U. S. Nation
Museum collections, from Van Buren, Arkansas, identified by Lesquere
as *Pseudopecopteris decipiens*. One of the fragments corresponds qu
closely to the pinnæ figured in Pl. II, Fig. 1, though the pinnæ of t
former are less obtuse than those of the latter. But there is also fro
the same locality a small specimen, No. 1027 of the Museum collectio
labeled *Pseudopecopteris cordato-ovata* Weiss sp., with pinnules round
above, which is clearly identical with the terminal portions of lar
pinnæ with oblong pinnules like those seen in Pl. I, Fig. 5, of our spec
mens. On the same specimen of rock and lying about 2^{cm} distant
the same plane of deposition, is the counterpart of one of the specimen
No. 1037, already referred to, labeled *Pseudopecopteris decipiens*, th
showing both the probable specific identity of the specimens from t
same rock labeled under two names, and the quite probable identity

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[1] Geol. Surv. Ark., II, Pl. II, Figs. 3, 3*a*, p. 310.

[2] Vol. I, p. 214.

[3] Pl. LII, Figs. 9, 9*a*.

[4] Vol. II, pt. 2, Pl. XI, Fig. 1.

[5] Vol. II, p. 312, Pl. V, Figs. 1, 1*a*.

teris decipiens with our specimens through the assured
Pseudopecopteris cordato-ovata.

ing then, the disagreements between all the published
d figures of *Pseudopecopteris decipiens*, on the one hand,
nd characters of the Missouri specimens on the other—
; to increase the number of species more than is abso-
—I have thought it best to assign to my specimens, for
t name, for the reason that among the wide range of
l by Prof. Lesquereux as belonging to that species,
are apparently identical with the Missouri type, and
s improper to attempt to revise and redefine or illus-
es without first examining the types and material ori-
by Lesquereux, which I have not yet been able to con-

scription, however, is based purely on the rich material
Missouri collection, and will represent the new species,
vill be the case, it is found necessary to separate it from
teris decipiens, with whose types, figures, and descrip-
little in common.

ens show tapering pinnæ terminating in a prolongation
At first sight this would appear to be due to accident
e pinnules in working out the specimens, but a careful
ler the lens shows the rachis, which is more rigid and
l, to be bordered on each side by a narrow lamina about
ding from the sinus above the highest pinnules, the
in of the pinnule clearly continuing along the border of
all three specimens the end of this extension of the
and lost at a distance of 3–5^{mm} above the highest pin-
rolongations of the rachis may, possibly, be regarded
ugh not conclusive, that the fructification of this spe-
n the reduced apinnulate terminal portion of the pinnæ.
ens the pinnules of the pinna decrease more rapidly in
ost being small and foreshortened, strongly resembling
ncompleta of Lesquereux,[1] or perhaps less suggestive of
icata or *Diplothmema Jacquoti* as illustrated by Zeiller,[2]
s coarctata of von Roehl.[3]

fragments like Fig. 5, Pl. I, are suggestive of *Pseudo-*
to-ovata as figured by Lesquereux in the Coal Flora,[4]
with the *Neuropteris cordato-ovata* of Weiss[5] has re-
estioned by Zeiller[6] on account of the more acutely
s and rather more crowded nervils of the latter. Of
plants identified as *Sphenopteris decipiens*, the one from

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nna., II, 2, 1858, p. 868, Pl. I, Figs. 12, 12*a*.
houill. Valenciennes, Atlas, Pl. XX, Figs. 3, 4; Pl. XVIII, Fig. 5.
. Steink. Westphalens, Pl. XIV, Fig. 5.
VII, Figs. 4, 5.
gst. Steink. u. Rothl., p. 28, Pl. I, Figs. 1, 1 *a*.
houill. Autun et Épinac, p. 35.

Bohemia described and figured by R. Andree,[1] whose identification probably followed by Karl Feistmantel[2] in his plants from the region seems hardly identical with the American forms of which nearest related is the *Sphenopteris dilatata* figured in the Arkansas port.[3]

Relations.—It is unadvisable to attempt to point out the differentiating characters between this and other species until it shall hav been better defined.

My specimens differ from the *Mariopteris speciosa* Lx., by their rach flat, not round, not so broadly alate, the pinnæ more evenly pinnat more obtuse, the pinnules smaller, not lobate, the basilar ones bilobat the nervils indistinct, closer and not inflated, while from *M. polyphyll* as identified by Lesquereux in specimens from Alabama, they are e ily distinguished by the larger pinnules of the latter species, lob irregularly, and usually more pointed.

Locality.—McClelland's shaft.

SPHENOPTERIS Brongniart. 1822.

SPHENOPTERIS (PSEUDOPECOPTERIS) OBTUSILOBA Brongn.

1829. *Sphenopteris obtusiloba* Brongniart, Hist. Vég. foss., p. 204, Pl. LIII, Fig. 1833: Sternberg, Versuch, II, fasc. 5 u. 6, p. 63. 1848: Sauveur, Vég. Belg., Pl. XV, Fig. 2. 1853: Newberry, Ann. Sci., I, No. 9, p. 106. 18 Ettingshausen, Steinkohlenfl. Radnitz, p. 37, Pl. XXI, Fig. 2. 1860: Lesq reux, Rept. Geol. Surv. Ark., II, p. 315. 1860: H. C. Wood, Proc. Ac Nat. Sci. Philada., XII, p. 440. 1866: Lesquereux, Geol. Surv. Ill., II, p. 1874: O. Feistmantel, Studien Kohlen. Böhmen, Pl. I, Fig. 9. 1876: Fer Roemer, Lethaea geognost., I, atlas, Pl. LI, Figs. 1*a*, 1*b*; text (1880), p. 1876: Lesquereux, Rept. Geol. Surv. Ala. for 1875, p. 75. 1878: Zeiller, V foss. terr. houill., atlas, Pl. CLXIII, Figs. 1, 2; text (1879), p. 39. 1879: Sch per in Zittel, Handbuch, II, p. 108, Fig. 77. 1880: Fontaine and I. C. Wh Permian Flora, p. 11. 1881: Weiss, Aus. d. Fl. d. Steink., Pl. XI, Figs. 67*a*. 1883: Renault, Cours bot. foss., III, p. 190, Pl. XXXIII, Figs. 5, 1886: Zeiller, Fl. foss. houill. Valenciennes, atlas, Pl III, Figs. 1, 1a, 2, Pl. IV, Fig. 1; text (1888), p. 65.

1833. *Sphenopteris irregularis* Sternberg, Versuch., II, fasc. 5 u. 6, p. 63, Pl. XV Fig. 4, fasc. 7 u. 8, p. 132. 1855 (?): Geinitz, Verst. Steink. Sachsens, p. 11, P XXIII, Figs. 2–4 (excl. syn.). 1860: F. A. Roemer, Palæontographica, I p. 24, Pl. IV, Fig. 5. 1865: Andrä, Vorweltl. Pfl. Steink., p. 26, Pl. VIII; P IX, Fig. 1. 1869: von Roehl, Foss. Fl. Steink. Westphalens, p. 56, Pl. XV Fig. 2 (?); Pl. XXXI, Figs. 5, 6.

1836. *Cheilanthites obtusilobus* (Brongn.) Goeppert, Systema, p. 246.

1836. *Cheilanthites irregularis* (Sternb.) Goeppert, Systema, p. 247.

1836. *Sphenopteris latifolia* Lindley and Hutton, Fossil Flora, III, Pl. 178.

1848. *Sphenopteris trifoliolata* (Art. ?) Brongniart, Sauveur, Vég. foss. terr. hou Belg., Pl. XIX, Fig. 2; Pl. XXI. 1869: von Roehl, Foss. Fl. Steink. Westph lens, p. 65, Pl. XVI, Fig. 3 (excl. syn.).

1869. *Sphenopteris (Aneimioides) obtusiloba* Brongn., Schimper, Traité, I, p. 38 XXX, Fig. 1.

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[1] N. Jahrb. f. Min., 1864, p. 167, Pl. IV, Figs. 2, 3.

[2] Steinkohlenbecken von Klein-Přilep, p. 55.

[3] Vol. II, Pl. II, Figs 3, 3*a*.

Gymnogrammides) irregularis Sternb., Schimper, Traité, I, p. 373.
(*Sphenopteris) obtusilobum* (Brongn.) Stur, Culm-Fl., II, p. 124

(*Sphenopteris) irregulare* (Sternb.) Stur, Culm-Fl., II, p. 124
: Stur, Carbon-Fl. Schatzlarer Sch., I, p. 296.
is irregularis (Sternb.) Lesquereux, Coal Flora, atlas, pl. LII,
?; text (1880), p. 211.
is obtusiloba (Brongn.) Lesquereux, Coal Flora, III, p. 753.
obtusilobum (Brongn.) Stur, Carbon-Fl. Schatzlarer Sch., I, pp.
. xxv, Figs. 8a–c; Pl. xxvb, Fig. 1.
rregulare (Sternb.) Stur, Sandberger, Jahrb. d. K.-k. geol. Reich-
pp. 84, 87, 90.

iate or quadripinnate below; rachis strong, flat, naked,
undulate below, becoming more flexuous towards the
inæ broad, lanceolate, acute, pinnatifid to near the
secondary pinnæ at right angles below, becoming
alternate, distant, contiguous or slightly imbricated,
acute, straight or curved, those in the middle and
f the primary pinnæ provided with pinnæ of the third
ve bearing reduced tertiary pinnæ or pinnatifid pin-
ll nearer the top being provided with large, broad,
r-ovate pinnules, divided into 3–5 more or less deeply
obtuse lobes; secondary and tertiary rachises narrow,
inctly flexuous to correspond to the insertion of the
les, but sometimes appearing nearly straight, sulcate
on the lower side, finely and evenly striate, bordered
uæ; tertiary pinnæ distinct, alternate, usually close,
it, or even overlapping, the lower ones at a right angle
y rachis, the upper somewhat oblique, 12–22ᵐᵐ long,
re or less acutely pointed, provided with 2 to 5 pairs
sile, or broad pedicellate, half-round, ovate, or reni-
d, usually more or less distinctly trilobate pinnules,
r slightly imbricated, those in the lower part of the
nt, slightly decurrent; surface of the pinnules coria-
kward somewhat near the border, and marked between
ie nerves with close, minute striæ; margins apparently
aversed on the upper side by a narrow furrow or gutter;
ipper secondary pinnæ broad, more or less deeply dis-
, sometimes four, broad, rounded or truncate-rounded,
, the lowest pair of the pinnules of the pinnæ subpal-
ito four to six lobes, one or more of the divisions some-
those pinnules toward the top of the pinnæ becoming less
and approaching the proportions of those borne on the
primary nerves originating at a narrow angle and curv-
hotomizing, the secondary nerves forking and curving,
border; fructification unknown.

h difference of opinion exists as to the basis of the
enopteris obtusiloba and *Sphenopteris trifoliata*, no two
on the lines of distinction between those species,
ists, including Zeiller, Kidston, Renault, and the late
tel, are agreed that the forms described by various
opteris obtusiloba and *Sphenopteris irregularis* are only
s of the same fronds. The identity of Andrä's speci-
as *Sphenopteris irregularis* with Brongniart's *Sphenop-*

teris obtusiloba, first pointed out by Stur,[1] was concurred in by who also verified the identification after an examination of Bron type of *Sphenopteris obtusiloba*. But while Zeiller and Kidston i the identity of these with Sternberg's type also, Dr. Stur, who c specimens described and figured by Andrä and von Roehl und *nopteris irregularis*, excludes, without stating his reasons, Ste original identification.

The identity of the species from the zinc region with that rep by a magnificent series of specimens from Clinton, Missouri, portions of nearly the entire plant before me. Large fragment frond show the upper secondary pinnæ of the species to be p with large ovate-deltoid, obtusely lobed pinnules agreeing exac the *Sphenopteris irregularis* illustrated by Andrä[3] or like the *S loba* figured by Brongniart[4] and Zeiller,[5] or the upper portion *Diplothmema obtusilobum*.[6] These forms I believe to be more nant in the upper part of the lateral primary pinnæ. The lo ondary pinnæ, with more fully developed pinnules or tertiary pi similar to those figured by Lesquereux[7] as *Pseudopecopteris irr* by Andrä[8] as *Sphenopteris irregularis*, by Stur[9] as *Diplothme silobum*, and by Zeiller[10] as *Sphenopteris obtusiloba*. Usually, h my specimens show the tertiary pinnæ ending in a small, more narrow deltoid, acute pinnule, somewhat different from the sp figured by Stur[11] and Zeiller,[12] the pinnules in most of the sp being also slightly larger. The American species agree well wi imens labeled *Sphenopteris obtusiloba*, from Radnitz, Bohemia, the collection of the U. S. National Museum.

Relations.—Although this species appears to have a close ship to the *Diplothmemata*, no specimen has, so far as I am awa discovered with the true *Diplothmema* ramification. Owing to certain boundary of *Sphenopteris obtusiloba*, I shall not attempt out the distinctions between it and other related species, alt am strongly inclined to regard many of the figures inscribed ous authors as *Sphenopteris trifoliata* to be only forms belon *Sphenopteris obtusiloba*, or to other species quite different from type.

Locality.—Aurora.

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[1] Verh. d. K.-k. geol. Reichsanst., 1876, p. 286.

[2] Vég. foss. terr. houill., 1879, p. 40.

[3] Vorweltl. Pfl. Steink., Pl. VIII, Figs. 1–3.

[4] Hist. Vég. foss., Pl. LIII, Fig. 2.*

[5] Vég. terr. houill., Pl. CLXIII, Fig. 1; Fl. foss. Valenciennes, Pl. III, Figs. 2, 3.

[6] Carbon-Fl. d. Schatzlarer Sch., I, Pl. XXV, Fig. 8.

[7] Coal Flora, atlas, Pl. LII, Figs. 1–3.

[8] Op. cit., Pl. IX, Fig. 1.

[9] Op. cit., Pl. XXV, Fig. 8.

[10] Op. cit., Pl. III, Fig. 4.

[11] Op. cit., Pl. XXV, Fig. 1.

[12] Op. cit., Pl. III, Fig. 1.

ERIS (PSEUDOPECOPTERIS) MACILENTA L. & H.

Pl. I, Fig. 4, 4*a*.

nacilenta Lindley and Hutton, Fossil Flora, II, Pl. CLI. 1855: Gei-
. Steink. Sachsens, p. 14, Pl. XXIII, Fig. 1. 1880: Fontaine and I.
Permian Flora, p. 12. 1887: Kidston, Radstock Series, p. 348.
obata Gutbier (non Morris) Abdrücke, p. 44, Pl. I, Figs. 11–15; Pl.
3.
ilentus (L. & H.) Gœppert, Systema, p. 357.
(*Aneimioides*) *macilenta* L. & H., Schimper, Traité, I, p. 400.
macilentum (L. & H.) Stur, Culm-Flora, II, p. 124 (230). 1885:
on-Fl. Schatzlarer Sch., I, p. 375.
lobatum (Gutb.) Stur, Culm-Flora, II, p. 123 (229). 1885. Stur,
Schatzlarer Sch., I, p. 375.
ris macilenta (L. & H.) Lesquereux, Coal Flora, III, p. 754, Pl.
. 2. 1889: Lesley, Dict. Foss. Penn., p. 799, (Fig. ?).
teris (*Sphenopteris*) *macilenta* (L. & H.) Lesquereux, Proc. U. S.
XI, p. 85.

nate; rachis rather strong, slightly flexuous; primary
distant, oval-lanceolate, acute; secondary pinnæ alter-
blique or sometimes at right angles or even reflexed
nceolate, 2–8cm or more in length, 1–3cm in width; second-
er narrow, slightly depressed above, raised below, usu-
correspond with the position of each pinnule; naked in
s, bordered by a narrow decurrent margin of the pin-
innules large, thin, alternate, distant, oblique to the
hose at the base of the pinnæ, more or less cuneate, usu-
tri-sublobate, the borders slightly arched; those in the
of the pinnæ broad, rather ovate, cuneate below or
e to the decurrent base, bordering the rachis with a nar-
se above becoming more cuneiform below, less distinctly
es bilobate, or rounded and entire at the apex, with
nents, gradually becoming more and more united, the
g narrow, cuneate, rounded, passing on to the connate,
terminal pinnule; those in the lower portions of the
inct, less oblique to the rachis, more contracted below,
ellate, broader, sometimes rhomboidal, rather more in-
ate, the lobes decurrent and sometimes feebly irregu-
, always rounded below, the basal pinnules less oblique,
d often palmately, lobate; principal nerves distinct be-
y decurrent, slender, arching outward, and forking two
the pinnules broaden, becoming faint near the border;
known.

en by the figures, the Missouri specimens agree quite
ith illustrations given by Lindley and Hutton and by
epresented by but eight specimens in the collection, all
the type figured. As a rule the pinnules are of a gener-
line below, curving downward at the attachment, and
nctly trilobate above, sometimes bilobate, or irregularly
g crenate in some cases, but with all the lobes short and
e not seen specimens showing the quadripartite char-
pteris and *Pseudopecopteris*, or the bipartite feature of
which the species has been referred by Stur. Its in-

clusion in *Pseudopecopteris* by Lesquereux may have been the r
the examination of specimens, or perhaps it was only followin
reference of the species to *Diplothmema.*

Relations.—*Sphenopteris macilenta* is one of the most distinct S
terids. It differs from *S. obtusiloba* and *S. trifoliata* by the much
size of the pinnules, which are more cuneate below, less dee
regularly trifoliate, not elongating, not pinnatifid except on t
mary rachis just above the secondary pinnæ. *Cyclopteris valid*
scribed and figured by Dawson, has a strong, rough primary ra
pinnules less developed near the apex of the pinnæ, the se
nerves springing from a single primary nerve. *Sphenopteris adi*
has its pinnules smaller and proportionately broader, less cune
so clearly trifoliate, and apparently not connate by a decurrent

SPHENOPTERIS LACOEI n. sp.

Pl. II, Figs. 5, 5a, 6.

1884. ? *Pseudopecopteris nummularia* (Gutb.) Lesquereux, Coal Flora, III, p
type, excl. syn.).

Fronds quadripinnate, spreading; primary pinnæ broad, a
angles or somewhat oblique to the rachis; primary rachis finely s
flat, or slightly arched, naked; secondary pinnæ alternate, clos
somewhat overlapping, oblique above, at right angles in the
and curving backward below, slender, linear-lanceolate acute,
contracted towards the base, nearly straight or gently flexu
curving, simply pinnate, or pinnatifid below, the largest divisio
developed as ultimate pinnæ, with the same relations to the se
pinnæ as those of the latter to the primary pinnæ; secondar
rather narrow, slightly flexuous to correspond to the position
pinnules, and bordered, at least in the upper part, by a very
lamina decurring from the pinnules; pinnules coriaceous, du
alternate, at right angles to the rachis below, oblique above
sometimes contiguous, or overlapping, usually with a decurrent
ment to the rachis, cordate-ovate, or somewhat querciform,
obtuse at the apex, alternately lobed, more or less constricte
base, especially on the distal side, the blade connate by a nar
current lamina; the larger pinnules, about 6^{mm} long, 3^{mm}. wi
stricted at the base so as frequently to appear pedicellate, the
ones above, becoming sessile by the slightly contracted base;
the lower part of the larger pinnules divided to near the midri
than those above, more or less distinctly cuneate toward the
rhomboidally rounded or rounded-truncate at the broad top,
separated by a narrow, decurrent rounded sinus, becoming in
upwards more connate and obovate, smaller, more united, an
obtusely rounded, gradually passing into the small indistinct t
pinnule; lobes of the pinnatifid pinnules broadening, becomi
distant, more pointed and crenate, sessile by the slightly con
base, then lobate and finally full developed pinnules; primar
strong, somewhat decurrent, especially in the upper part of the
though often appearing simply inclined or at right angles to th
in the lower part, sometimes appearing as a short pedicel; ne
obscure, a primary nerve passing into each lobe, and emitting
that usually fork once, but a portion of the nervils in the lowe

arently spring directly from the mid-rib; fructification

volume of the Coal Flora.[1] Prof. Lesquereux describes
der the name of *Pseudopecopteris nummularia* (Gutb.)
ng that the description of the specimens in hand did not
with the descriptions and figures of the European au-
gesting that they might represent one or even two new
pe including the plants from Clinton, Missouri, and Can-
lvania, the other having been found at Campbell's Ledge
ennsylvania, and in strata of nearly the same age in
nding the specimens in the collection to be apparently
others now in my hands from Clinton, Missouri, I was
that these represented the second or Clinton-Cannelton
pecopteris nummularia*, although this type is obviously
Gutbier's type of *Sphenopteris nummularia*, which has
by some authors to *S. obtusiloba*, or from Heer's figure,[2]
ted by others as a good species. From specimens from
Pittston, kindly loaned me by Mr. Lacoe, the difference
o types of Lesquereux is seen to be quite distinct. The
is most like the figure given by Heer. As to the other
e informs me that Prof. Lesquereux, in a manuscript
that the Cannelton plant is "certainly a species different
mpbell's Ledge." No name for the new species is given
eux manuscript now in the hands of Mr. Lacoe, which it
ped may be published at an early date. Being unable
ith any other described species, I have dedicated it to
o has done more than any other to promote the study of
lora of the United States, and to whom I am greatly in-
nsel and for the use of specimens in the preparation of this
is but little difference between the specimens from Clin-
ville and those from Cannelton, except that the former
her more open, with the midrib somewhat thinner, tend-
ses towards flexuosity. The nervation in the Cannelton
re on account of the roughness of the epidermis, which
a close venation, and which has led the artist to draw
close in the detail of the Cannelton pinnule.

many closely related or resemblant species assigned by
rs to *Sphenopteris*, *Hapalopteris*, *Oligocarpia*, *Hymeno-*
Renaultia, *Sphenopteris Lacoei* is quite easily distin-
size of its pinnules, which are rather acute, contracted
nt attachment and narrowly bordering the rachis, de-
l, the lobes entire, the lower ones cuneate below, trun-
above, the succeeding ones narrower, becoming more
the apex obtuse, passing into confluence with the very
ed terminal pinnules.

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[1] P. 751, Pl. CIII, Figs. 1–3.

[2] Fl. foss. Helv., Pl. XIV, Figs. 6, 6b.

Relations.—Among the nearest allied species *Sphenopteris Lac*
fers from the forms referred to *S. stipulata*, *S. quercifolia*, *S. La*
and *S. gracilis*, by the irregular lobation among the latter, th
being more or less distinctly divided. The last-named species, w
figured has its pinnules hardly decurrent, I am unable satisfa
to separate from some of the upper and looser portions of *S.*
Schimper. The latter differs from *S. Lacoei* by its rachis rough, s
more slender and more flexuous in the smaller divisions, the sec
and ultimate pinnæ usually overlapping, the pinnules roughe
borders arching slightly backward, more obtusely pointed, not
ularly nor deeply lobate proportionately, the lobes not cuneate
wards, not so decurrent, broader at the base, more pointed, cre
sometimes sublobate, the sinuses more acute, the nerves dist
relief on the lower surface, and more flexuous. *Sphenopteris ma*
Dawson, whose foliage is somewhat similar, is described as hav
pinnæ short, obtusely pointed, the pinnules less dissected, the
simple; while *Hapalopteris* (*Sphenopteris*) *rotundifolia* (Andrä
which strongly resembles our species, has its pinnules rather
less decurrent, the lobes not cuneate, the terminal lobe large and
From *Sphenopteris nummularia* it strongly differs, the size of t
nules being much greater, the pinnules of that species being
decurrent, the midrib straight, the lobes more distant, broadly
pointed above, roundly contracted at the base, pedicellate, be
trilobate in the lower part of the pinnule, bilobate in the midd
elliptical above, the terminal lobe large and oval, more or less d
similar to forms of *S. trifoliolata* or *S. obtusiloba*, to which it ha
assigned by several authorities. The normal lobes of *S. numm*
pedicellate with entire margins, have the size of those small cre
feebly lobed sessile pinnules of *Sphenopteris Lacoei* which are
into ultimate pinnæ.

Locality.—McClelland's shaft.

SPHENOPTERIS HILDRETI Lx.

1854. *Hymenophyllites Hildreti* Lesquereux, Bost. Jour. Nat. Hist., VI, No. 4
1858: Geol. Penna., II, 2, p. 863; Pl. IX, Figs. 5, 5^a. 1861: Lesquereu
Surv. Ky., IV, p. 434.

1877. *Diplothmema* (*Hymenophyllites*) *Hildreti* (Lx.) Stur, Culm-Flora, II,
(228), 124 (230). 1885: Stur, Carbon-Flora Schatzlarer Sch., I, p. 29

1880. *Sphenopteris* (*Hymenophyllites*) *Hildreti* Lesquereux, Coal Flora, I, p. 28
Lesley, Dict. Foss. Penna., I, p. 292 (figure).

Fronds polypinnate; rachis narrow; pinnæ more or less obliqu
nately divided; pinnules oblique, decurring to the winged rachis
in outline, pinnately lobed; lobes cut to the base or to the middle
to five linear, acute laciniæ; primary nerves divided according
subdivisions of the lobes, each lobe being entered by a simple b

The specimens, three in number, which I have referred to *Sphen*
Hildreti, agree excellently with the original figures of that spe

ıe description in the Coal Flora which I have quoted
ıchis is slender, striate, and slightly sinuate. The pin-
re slightly coriaceous, appear sympodially dichotomous
ınate in their mode of division, the effect being a pinnate

finities of the species with *Diplothmema furcatum* and
it seems quite probable that it also belongs to the genus
o which Dr. Stur assigned it in 1877.[1] Kidston[2] has sug-
may be referable to *Diplothmema furcatum.* My speci-
re identical in character with that illustrated and de-
Geology of Pennsylvania,[3] seem quite distinct from
urcatum, and it may be added that there are no true
hat species in the collection.

n from the Middle Devonian at St. John, New Bruns-
but not described, by Sir William Dawson as *Hymeno-
eti* Lx., appears to represent a different species, with
sected pinnules and much broader laciniæ, resembling
pect the *Sphenopteris subfurcata* described by him[4] from
ty.

Sphenopteris Hildreti was described by Lesquereux as
Diplothmema furcatum by its narrower rachis, not genicu-
es all pinnately lobed, none palmately, the laciniæ shorter
nctly lanceolate-acute. It is also much more delicate than
urcatum. I have not seen sufficient material to ascer-
here is a difference in the division of the primary rachis
h species are Diplothmemæ. It appears to differ from
eniculatum, to which it stands closest, by its rachis, not
foliage more dense, the divisions of the pinnules not so
ading from the base, and not so long relatively, the
unded at the bottom. *Sphenopteris trichomanoides* and
nceolata are not so broadly divided; the laminæ are shorter
se, the rachis of the latter species being much stronger
as more bushy.

cClelland's shaft.

SPHENOPTERIS, SPECIES.

Pl. I, Fig. 3.

pecimens in the collection appear to be different from
presented in material that I have seen. I have figured
th the hope that it may be recognized by some more ex-
ontologist. The rachis is striate and rough. The median
slightly decurrent, and flexuous. Pinnules coriaceous,

Flora, II, p. 122 (228). Carbon-Flora Schatzlarer Sch., I, 1885, p. 296.
al. Pl. Brit. Mus., p. 81.
I, pt. 2. 1858, p. 863. Pl. IX, Figs. 5, 5*a*.
Pl. Dev. and Upp. Sil. Can., 1871, pp. 54, 86, Pl. XVI, Fig. 181.

slightly oblique, deeply dissected. The divisions are ovate, pedic
decurrent, bordering the midrib, the lower ones suggesting the o
of an acorn, only they are round at the apex. The real condit
each division is trilobate, the two basal lobes narrow and insigni
slightly reflexed, the third and upper lobe ovate, rounded, consti
three-fourths of the entire division. In this respect it differs fro
trilobate forms of *Sphenopteris trifoliata*, *Sphenopteris obtusilo*
Sphenopteris nummularia Gutb.,[1] the last named of which it rese
more closely in the general proportions. The form of the divi
much like that seen in portions of the *Sphenopteris Böckingiana* fi
by Weiss.[2] The nerves are rather strong and close, branching
nately from the median nerve and forking again.

The second fragment, apparently belonging to the same specie
its divisions of the same character. It represents the tip of a
the uppermost divisions being either macerated or otherwise de
of parenchyma. It is possible that both specimens represent
pinnæ of some species, though no distinct evidence of fructifica
visible.

Locality.—McClelland's shaft.

PECOPTERIDEÆ.

PECOPTERIS Brongniart. 1822.

PECOPTERIS DENTATA Brongn. (non Will.)

1828. *Pecopteris dentata* Brongniart, Prodrome, pp. 58, 170. 1834: Brongniart,
p. 346, Pl. cxxiii, cxxiv. 1835: Lindley and Hutton, Fossil Flora
cliv. 1838: Sternberg, Versuch, ii, 7 u. 8, p. 152. 1870: Lesquereux
Geol. Surv. Ill., iv, 2, p. 404. 1876: Ferd. Roemer, Lethaea geoguos
las, Pl. lii, Figs. 1a, b; text (1880), p. 176. 1878: Zeiller, Vég. fo
houill., atlas, Pl. clxviii, Figs. 3, 4; text (1879), p. 86. 1879: Lesq
Coal Flora, atlas, Pl. xliv, Figs. 4, 4a; text (1880), p. 240. 1880: F
and I. C. White, Permian Flora, p. 66, Pl. xxii, Figs. 1, 2, (3–5 ?).
Renault, Cours bot. foss., iii, p. 121, Pl. xxi, Figs. 4, 5. 1884: Lesq
Amer. Nat., xviii, p. 922. 1887: Lesquereux, Proc. U. S. Nat. Mus.,

1828. *Pecopteris plumosa* (Artis?) Brongniart, Prodrome, p. 58, 171. 1835 c
Brongniart, Histoire, p. 348, Pls. cxxi, cxxii. 1838: Presl, in Ste
Versuch, ii, 7 u. 8, p. 152. 1858: Lesquereux, Geol. Penn., ii, 2, p. 867.
Lesquereux, Geol. Surv. Ill., ii, Palæont., p. 442. 1869: von Roehl, F
Steink. Westphalens, p. 88, Pl. xxxiii, Fig. 4. 1881: Weiss, Aus d
Steink., Pl. xvii, Figs. 104, 104a. 1888: Howse, Trans. Nat. Hi
Northumb., etc., x, 1, p. 89.

1828. *Pecopteris triangularis* Brongniart, Prodrome, pp. 58, 171.

1832. ? *Sphenopteris caudata* Lindley and Hutton, Fossil Flora, i, Pl. xlviii.

1833. *Cyatheites dentatus* (Brongn.) Goeppert, Systema, p. 325. 1855: Geinitz
Steink. Sachsens, p. 26, (pars), Pl. xxix, Figs. 10–12; Pl. xxx, Fi
1869: von Roehl, Foss. Fl. Steink. Westphalens, p. 87, Pl. xxxiii,
1876: Heer, Fl. foss. Helv., p. 30, Pl. xi; Pl. xii, Figs. 1–5.

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[1] Abdrücke, 1835, p. 43, Pl. iv, Figs. 5, 5a, 5b, 5c; Pl. x, Figs. 7, 8, 8a; Pl. xi, Fig. 3. Heer,
Helv., p. 14, Pl. xiv, Fig. 8, Andrä, Vorweltl. Pfl., p. 35, Pl. xi.

[2] Foss. Fl. jüngst. Steink. u. Rothl., Pl. vii, Figs. 1, 1a.

Brongniartiana Presl, in Sternberg, Versuch, II, 7 u. 8, p. 160.
plumosus (Artis?) Goeppert, in Bronn, Index palæont., p. 365.
ous dentatus (Brongn.) Weiss, Foss. Fl. jüngst. Steink., p. 86.
(*Cyatheites*) *dentata* Brongn., Schimper, Traité, I, p. 508.
gia dentata (Brongn.) Stur, Culm-Flora, II, p. 187 (293).
gia plumosa Stur, Culm-Flora, II, p. 187 (293). 1885: Stur Carb.-
tzlarer Sch., vol. I, p. 92 (pars), Pl. LI, Figs. 1, 2, 3.
ca dentata (Brongn.) Zeiller, Ann. Sci. nat., [6] bot., XVI, pp. 184,
IX, Figs. 12–15. 1884: Zeiller, Ann. Soc. géol. Nord, XI, p. 206. 1888:
Fl. foss. Valenciennes, p. 30, Figs. 16a, b. 1890: Zeiller, Fl. foss.
t Épinac, I, p. 21, Figs. 17a, b.
gia acuta (Brongn.) Stur, Carb.-Fl. Schatzlarer Sch., I, p. 96, Pl. LI,
5.
(*Dactylotheca*) *dentata* Brongn., Zeiller, Fl. foss. houill. Valenciennes,
l. XXVI, Figs. 1, 1a, b, 2, 2a–e; Pl. XXVII, Figs. 1, 1a, b, 2, 2a, 3, 3a,
XVIII, Figs, 4, 5, 5a; text (1888), p. 196. 1890: Zeiller, Fl. foss. Autun
ac, I, p. 66, Pl. IXa, Figs. 3, 3a.
ca plumosa (Artis?) Kidston, Radstock Ser., p. 381. 1886: Kidston,
l. Pl. Brit. Mus., p. 128. 1889: Kidston, Trans. R. Soc. Edinb., vol.
, No. 10, p. 409. 1890: Kidston, Proc. Roy. Phys. Soc. Edinb., x, pp.
, 386.
ca plumosa var. *dentata*, Kidston, Radstock Ser., p. 382.

ge, tripinnate, quadripinnatifid below; primary rachis
wide, finely trichomatose; secondary rachis 1–5^{mm} broad,
he upper surface and finely punctate; primary pinnæ
right angles or oblique, often reflexed in the lower part
usually overlapping slightly, 3½–11^{cm} apart, oval-lance-
, or more, long, 3½–12^{cm} wide at the middle, somewhat
the base, the sides of the larger ones parallel in the
n, and tapering to a sharp point above; secondary pinnæ
2^{mm} apart, usually overlapping somewhat, the upper ones
middle nearly at right angles, the lower ones often re-
horter, often flexuous, linear-lanceolate, the larger ones
5–25^{mm} wide, tapering to an obtusely acuminate point;
nate, more or less triangular, somewhat arched, generally
ted or rounded, sometimes acuminate at the tip or appear-
mewhat oblique, sessile, contiguous and slightly connate
hose in the middle of the secondary pinnæ 35^{mm} long, av-
t 2^{mm} in width at base, the margins generally more or less
s to make them appear sharply triangular, the laminæ
een the nervils, either entire or with a few rounded, usually
es; the lower basilar pinnule of each secondary pinna
rter and lobate, sometimes appearing auriculate; pinnules
op of the secondary pinnæ gradually becoming confluent,
entire or slightly lobed apex of the pinnæ; pinnules of the
ary pinnæ near the base of the frond, 5–13^{mm} long, 2–4^{mm}
fid, or perhaps pinnate, the divisions being about 1½^{mm}
wide, the uppermost secondary pinnæ with pinnules be-
d and passing into primary pinnules, pinnatifid below
obes, the succeeding ones crenulate, then entire; nerves
distinct, the median nerve passing to the top, but very
all, decurrent, emitting nervils at a wide angle, the lower
g, the upper ones simple, those of the large pinnatifid pin-
off other simple nervils in the lower lobes.

Considerable difference of opinion exists among paleobota
to the range of forms to be included in this somewhat polym
species. While most authors agree in uniting *Pecopteris den*
P. plumosa (Artis?) Brongn., a few, including so distinguished
botanist as Director Stur, insist on their distinction as two
species. But Stur, referring to Brongniart's figures and desc
joins[1] *P. pennæformis* Brongn. to *P. plumosa*. On the other
delicatula Brongn., which is made a variety of *P. plumosa* by
and of *P. dentata* (*P. plumosa* Brongn. non Artis) by Zeiller, [3]i
by Stur[4] with *P. acuta* Brongniart. Kidston is inclined, on t
of distribution, to partially separate *Pecopteris dentata* as a v
Pecopteris plumosa. Happily, as one of the important result
painstaking examination of many of Brongniart's type sp
Zeiller has been able to clear up many of the doubts respect
as well as many other species described in the Histoire, an
given excellent and elaborate new descriptions, amplifying a
fining those species, in his classical work on the Valencienn
As the result of his investigations of the old specimens as w
much new material, he finds both *P. plumosa* and *P. dentat*
same species, thus verifying the conclusions of Schimper, Les
Geinitz, and others of the older paleobotanists.

The specimens in the present collection are identical wit
labeled by Lesquereux in the U. S. National Museum collection
as with a fine series communicated by Dr. J. H. Britts from
Missouri, whence some of the specimens described in the Coa
originated. The agreement of these fine specimens with Zeil
ures and descriptions[6] is good in nearly every detail. The figu
by Lesquereux on Pl. XLIV does not represent the pinnules so s
so crenulate or lobed, nor so pointed as they appear in my sp
The laminæ in the latter are more arched between the nerves,
gins rolled back so as to give them a sharper appearance, th
midrib sunken and tending to become flexuous in the partly m
specimens, and the lower basal pinnules of the secondary pin
or more or less auriculate. Some of the pinnules are acute,
acuta Brongn., which *P. dentata* further resembles by th
veined pinnules of the upper part. The general habit, as see
species, is better indicated by Fontaine and I. C. White
Permian or Upper Carboniferous Flora, Pl. XXII, Figs. 1 and 2,
the latter seem to somewhat resemble *P. acuta*. The variet
Fig. 2, of these authors is similar to the pinnatifid pinnules
base of the lower secondary pinnæ. The Missouri representa
this species are most adequately represented by the figures of

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[1] Carbon-Fl. Schlatzlarer Sch., I, p. 93.

[2] Foss. Fl. Radstock Ser., p. 381; Trans. Yorkshire Nat. Union, pt. 14, 1888 (1890),

[3] Fl. foss. houill. Valenciennes, p. 196.

[4] Op. cit., p. 97.

[5] Vol. I, p. 241.

[6] Op. cit., p. 196, Pl. XXVI.

l Zeiller.[3] One large fragment of the basal portion of a
shows the pinnules delicate and slender as in *P. delica-*
do not venture to refer it to that form.
is believed by many authors that the type of Artis's
sus[5] is specifically identical with Brongniart's *Pecopteris*
sp., and that Artis's name has therefore priority over *P.*
n., the incompleteness of Artis's description and figure and
y indicated fructification near the margin, differing from
. dentata (*P. plumosa* Brongn.), render the evidence too
t seems to me, to warrant such a conclusion, and I am
ow Zeiller in retaining *P. dentata* for the present. *Filici-*
rtis seems to be represented in form, nervation, and fruc-
e *Pecopteris* (*Aspidites*) *silesiaca* of Goeppert.[6]
ation of *Pecopteris dentata* worked out by Zeiller from
ified material constitutes the type of the genus *Dactyl-*
nsists of exannulate ovoid sporangia, separate from
btuse at the base, 0.5–0.75^{mm} long, 0.2–0.25^{mm} broad,
acute apex, each sporangium lying on one of the ultimate
of the lower pinnules, the apex pointing toward the

æ, which, in spite of their caducity, are frequently found
rachis near the origin of the primary pinnæ of this spe-
n observed by Fontaine and White, Stur, and Zeiller.
n described as oval in outline, lying close to the rachis,
g it, deeply pinnatifid in close linear lobes, the lower ones
natifid, with surface finely striate and apparently cov-
hairs. A few such aphlebian fragments were found in
but none are attached to rachises with other pinnules.
ial fragment from Clinton resembles the *Aphlebia filici-*
y Geinitz[8] on the rachis of *Pecopteris dentata* Geinitz (non

Pecopteris dentata differs from *P. pennæformis* by its sul-
r more strongly punctate rachis, its pinnæ larger and
and its pinnules more triangular. *P. pennæformis* is de-
ing the secondary nerves simple or forking but once, the
upwards in sharp ridges between the nervils, and the
pparently in two rows of round dots, one on each side of
Pecopteris acuta Brongn. has its rachis rather smoother,

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ire, Pls. CXXI, CXXII, Figs. 3, 4, and *P. dentata*, Pls. CXXIII, CXXIV.
nosa, Foss. Fl. Schlatzlarer Sch., I, Pl. LI, Figs. 1, 2, 3, and *S. acuta*, Figs. 4, 5.
alenciennes, Pls. XXVI, XXVII, Figs. 2, 3, 4.
., Pl. CXVI, Fig. 6. Zeiller, op. cit., *P. dentata*, var. *delicatula*, Pl. XXVIII. Figs. 5, 5a.
Pl. XVII.
. XXVII.
Bot., XVI, 1883, pp. 184, 207, Pl. IX, Figs. 12–15. Fl. foss. houill. Valenciennes, 1888,
Figs. 2, 2a, d. Fl. foss. Autun et Épinac, 1890, p. 21, Fig. 17a, b, p. 67.
chsens, p. 26, Pl. XXV, Fig. 11.

the pinnules more acutely falcate, and the nerves almost invarial ple, while *P. aspera* Brongn. is distinguished by its shorter pinnæ at right angles to the rachis, the pinnules more rounded, minal ones distinct and obtuse, and the nerves more flexuous.

Locality.—McClelland's shaft.

PECOPTERIS (PTYCHOCARPUS) UNITA Brongn.?

Fronds large, bipinnate or tripinnate; primary pinnæ broad, late, tapering to an acute point; primary rachis broad, flat, s secondary pinnæ alternate or subopposite, 2–5^{mm} apart, nearly angles to the rachis or somewhat oblique, parallel, linear, 2–4^{c} 5–11^{mm} wide, the borders nearly parallel, converging slightly r rounded apex, crenulate, lobate, or pinnatifid, according to the tion higher or lower on the primary pinnæ; secondary rachis slender, flexuous in the smaller pinnæ, more or less decurrent solving just below the apex; secondary pinnæ succeeded above primary pinnæ by and passing into distant, oblique, linear pi rounded at the apex, crenulate, then crenulate below and entire becoming entire in passing upward, decurrent and connate by ring border, united more deeply in approaching the tip of the pinnules of the ultimate pinnæ, represented by crenation, lob well-defined pinnules according as the pinnæ occur lower on th united about one-half their length in the average pinnæ, curvi ward to nearly a right angle, the apices gradually rounded, the r slightly reflexed, the texture rather thin, the more mature p 6–7^{mm} long, close, alternate, decurring somewhat, contiguous middle, united below, the margins converging a little towa rounded apex; median nerve originating at a narrow angle, arch ward towards the tip of the pinnule; secondary nerves alterna ally simple except in the larger pinnules, nearly straight or toward the apex, not anastomosing, and marked near the bo fusiform enlargements, the distal ends of these enlargements rather thicker than the proximal ends.

The specimens, numbering about twenty-five, which I refer wi doubt to the above species, are apparently members of the san but, owing to the rather macerated appearance of a portion o some of the characters seem too obscure in parts of the frond an absolute identification with *P. unita*. The simple pinnules upper end of the primary pinnæ have their nervation too poo served for an accurate description, besides which they are rat ther apart than those commonly described as belonging to that The upper secondary pinnæ agree very well with those illustr Stur[1] as *Diplazites longifolius* Brongn. sp., and by Lesquereu ston[3], and Zeiller[4] as *Pecopteris unita*, the crenulate forms be more nearly entire towards the apex, which is rounded, as seen 3 of Stur's plate, which illustrates the secondary pinnæ of m mens better than any I have seen, although his figures of the imary pinnæ are widely different from those described at ons of these pinnæ. The more deeply lobed secondary to Fig. 2 of Stur, bear evidence of fructification, but e too macerated to reveal the characters of the sori in aly material. The thickening of the ultimate nervils, in *Diplazites* as figured by Göppert, Stur, and other rued as indicating the beginning of the sori, appears her up on the nervils and rather more obtuse at the n is commonly represented in *P. unita.* The secondary it little towards the apex, while those more fully devel- r pinnules rather broad and arched backward, as shown d Lesquereux.

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[1] Carbon-Flora d. Schatzlarer Sch., Pl. LXIII, Figs. 2, 3.

[2] Coal Flora, Pl. XL, Fig. 2.

[3] Foss. Fl. Radstock Ser., Pl. XXIV, Fig. 4.

[4] Fl. houill. Valenciennes, Pl. XVIII, Figs. 1, 2.

of the uncertainty attached to the specific reference of e not attempted to give the synonymy of *P. unita*, which any authors to include *P. emarginata* and *P. longifolia*, he description of the specimens to wait ultimate absolute r separation.

The specimens in this collection differ perhaps from *P. arginata*, as those species are usually described, by the ce between the fully developed pinnules, the slender, s rachis of the median secondary pinnæ, and the large, le forming the apex of the secondary pinnæ.

cClelland's shaft.

TERIS (ASTEROTHECA) LESQUEREUXII n. sp.

Pl. II, Fig. 4.

rborescens (Schloth.) Brongn., Lesquereux, Coal Flora, I, p. 230, l. syn. et fig.).

aspidioides Brongn., Lesquereux, Coal Flora, III, p. 756.

innate; primary pinnæ broad, tapering rapidly to an econdary rachis rather broad, striate, more or less dis- ely punctate; secondary pinnæ alternate, open, close, eous, linear, 7^{mm}–3^{cm} wide, slightly narrowed at the base, nverging very gently in the middle, contracting more the tip to an acute apex; pinnules alternate, open or e, usually nearly at right angles to the rachis, very close, s, occasionally flexuous, linear, the length usually four to idth, flat, or rarely with margins slightly arched, the lat- arly parallel or slightly converging, the apex gradually l near the base, sometimes a little contracted in the s, the rachis being bordered by a narrow, decurrent n nerve strong, distinct, passing to the apex, usually ent, but frequently at right angles to the rachis in the s; secondary nerves of the smaller pinnules, simple, tly arching to the borders or nearly straight, or, rarely, oid; a few of the nerves in pinnules of the average size ing once near or above the middle, the lowest pair usu- ar the base, but most of the upper ones simple, while in

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[1] Foss. Fl. Radstock Ser., Pl. XXIV, Figs. 3, 9.

the larger pinnules of the largest secondary pinnæ and those a
secondary pinnæ on the primary rachis the nerves fork once at
wide angle below the middle, the upper division usually forkin
fertile pinnules of the same form and arrangement as the steri
tification in oval or round sori, disposed in two rows, one on e
of the median nerve, nearly covering the lower surface of the p
sporangia, four or five in the sorus.

This species, represented by a large number of specimens
tinctly characterized by the long slender pinnules, contiguous o
distant, usually slightly decurrent in the smaller pinnules, u
about 1^{mm} at the base, the borders converging slightly, the bl
the apex obtuse, not round truncate, and by the peculiar ne
The nerves of the smaller pinnules are simple, as in *P. arbore*
P. hemitelioides. In those of the average size, about 9^{mm} long a
wide, the lower pair of nerves fork, and here and there, irregu
the pinnule other nerves fork, like those of *P. cyathea* or *P.*
Only in the largest pinnules, $10–15^{mm}$ in length and $2\frac{1}{2}–3^{mm}$ i
are the nervils, all branching near or above the middle, similar
of *P. Candolliana* and *P. Monyi*, the upper division occasionally
again, especially in the pinnules succeeding the secondary pin
these largest pinnules there is an occasional constriction at t
suggestive of *P. Candolliana*, but the rachis is bordered by a
decurrent lamina, uniting the pinnules, which have the surfa
nearly flat, are not constricted at the middle, and which are
tionately considerably longer than the pinnules of *P. Candollia*

In general habit the pinnæ and pinnules resemble *Pecopteri*
rachis[1] and *P. cyathea*,[2] though its pinnules are flatter, not di
the base, and irregular in length as in the latter. The closest si
in the arrangement of the pinnules and nervation is with *P.*
ioides, except that our pinnules are not separate and all simple
and with *P. Monyi*,[3] whose pinnules are much more oblique, de
much broader proportionately, the margins converging more
The latter species appears somewhat closely related to *P. venul*
but Lesquereux's species has the pinnules less united, short
curved, the midrib stronger, and the nerves curving upward
of the smaller pinnæ are suggestive of *P. platyrachis* as figure
Coal Flora. However, the figure given by Lesquereux[5] is a
Fig. 5 on Plate CIII of Brongniart's Histoire, in which work i
assigned by Brongniart (p. 312) to *P. platyrachis* and again on
lowing page to *P. lepidorachis*. However, since a smooth rachis
the distinctive characters of the former species as diagnosed b
niart, it seems more probable that the reference to *P. lepido*
the one the author intended should remain, although the pinn

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[1] See Brongniart, Histoire, Pl. CIII, Fig. 1; also, Zeiller, Fl. houill. Commentry, I, Pl. XII,

[2] Brongniart, op. cit., Pl. CI, Fig. 4.

[3] See Zeiller, op. cit., Pl. XI, Figs. 6, 7, and Pl. XVII, Figs. 3, 4.

[4] Coal Flora, I, p. 230, Pl. XLI, Figs. 1, 1a.

[5] Atlas, Pl. XLI, Fig. 5.

yathea. It is possible that the specimens forming the iereux's description[1] may be referable to *P. lepidorachis* both of which have been referred by many authors to Renault and Zeiller have with reason, as it seems to them as species, after an examination of the original with new material, with concise and distinct definitions. e collection, containing over one hundred and fifty speci- g to this species, I have not seen any fragments referable *ens.* My specimens are apparently identical with those n collection labeled by Lesquereux as belonging to *P.* 3ut *P. aspidioides*, characterized by Brongniart as having ptical-oblong pinnules, distinct to the base, with simple, s, and as differing from *P. arborescens* only in its greater otuser pinnæ, and less truncated pinnules, is generally elonging either to *P. arborescens*, to which the above ed it as very closely related, or to *P. cyathea*, the agree- ures being quite close. Since the name *Pecopteris aspid-* therefore be retained and employed to designate our v name can be more appropriate than that of the great aborator of the American coal flora.

Pecopteris Lesquereuxii differs from *P. arborescens* by its pinnæ with the apices more obtuse, the pinnules usually ble the length of those of the latter species, not distinct ore often slightly apart, sometimes slightly decurring in nnules, gradually rounded, not truncate-rounded, at the ls sometimes branching once irregularly in the larger ipper division occasionally branching again in the largest rally curving more or less to the border. *P. cyathea* has ntiguous, separate to the rachis, often reflexed, shorter y, unequal in length, the margins often curved back- rangia in pairs or fours. *P. lepidorachis* has the rachis tate, its pinnules contiguous, distinct to the base, the forked below the middle. *P. hemitelioides*, whose form s closely, has its rachis rougher, the pinnules rather ortionately, usually separate at the base, and all the *P. Candolliana* is easily distinguished by its pinnules l distinct at the base, the margins usually rolled back, as to give it a contracted appearance in the middle, and always forked. *P. Monyi* and *P. venulosa* have the pin- oidly tapering, shorter proportionately, those contiguous coming separate above, the midrib of the larger pinnules t, and but few of the nervils forking once in the larger former species having a thinner median nerve, while the median nerve thickened near the base.

IcClelland's shaft.

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[1] Coal Flora, I, p. 232.

NEUROPTERIDEÆ.

NEUROPTERIS Brongniart. 1822.

NEUROPTERIS FIMBRIATA Lx.

1852. *Cyclopteris fimbriata* Lesquereux, Proc. Boston Soc. N. H., IV, p. 1
Lesquereux, Boston Jour. N. H., VI, 416. 1858: Lesquereux, Geol.
p. 855, Pl. IV, Figs. 17, 18. 1863: Dawson, Can. Nat., VIII, p. 442. 18
Trans. Am. Phil. Soc., XIII, p. 348. 1878: Dawson, Acadian Geol.,
481. 1878: Lesquereux, in I. C. White, Rept. Prog. Geol. Surv. Pe
p. 54. 1880: Fontaine and I. C. White, Permian Flora, p. 17.

1857. *Neuropteris fimbriata* Lesquereux, 3d Rept. Geol. Surv. Ky., p. 536.
quereux, 2d Rept. Geol. Surv. Ark., p. 315. 1866: Lesquereux, G
Ill., II, Paleont., p. 430. 1870: Lesquereux, Geol. Surv. Ill., IV,
384, Pl. VI, Fig. 4. 1874: Schimper, Traité, III, p. 474. 1879: Le
Coal Flora, I, Pl. V, Figs. 1–6; text (1880), p. 81. 1880: Fontaine
White, Permian Flora, p. 51. 1883: Lesquereux, 13th Ann. Rept. G
Ind., Pt. 2, p. 52, Pl. X, Fig. 2. 1887: Kidston, Foss. Fl. Radstock S
Pl. XXI, Figs. 3–5.

1860. *Cyclopteris Wilsoni* H. C. Wood, Proc. Acad. Nat. Sci. Phila., XII, p.

Fronds tripinnate; primary pinnæ apparently large, triangu
ondary pinnæ linear, slightly oblique; rachis round, undulat
striate, more or less punctate, bearing alternate, distant, ova
long, or nearly round, rarely entire pinnules, generally fringed
middle upward, auricled and entire at the broad base, pedic
the upper pinnules, which are slightly decurring; veins disti
ellate and dichotomous from the base, dividing three or four
the larger pinnules, generally twice in the smaller ones, slightl
toward the borders, and ascending to the top of the long,
acute, undulating fimbriæ.

The foliage of this beautiful fern has been fully illustrated
Lesquereux in the Illinois and Pennsylvania reports. My s
show considerable variation in the closeness of the nervation of
pinnules, the fimbriæ in some pinnules becoming corresp
crowded and much closer than in Lesquereux's figures. The l
slender, sometimes as much as 7^{mm} in length, usually tapering
base to a fine sharp point, and wavy. In one large pinnule,
parted below the middle into two lobes, dichotomously, the lon
are largely dichotomous, lending an Aphlebian aspect to po
the margin. A similar bifurcation of the laciniæ on a small sca
to be present on one specimen figured in Kidston's Radstoc
The nervation in some pinnules seems fully as close as that i
figure of *Cyclopteris lacerata*,[2] and appears to justify the incli
Schimper and Kidston to unite the two species, though Weiss
Heer's species as belonging in part to *Neuropteris heterophylla*.[3]
the American and Swiss species prove to be identical, *Neuropt
briata* will have priority.

Relations.—This fern is quite easily distinguished in its la
nules by the normally fimbriate margins. It differs from *Ne*

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[1] Trans. Roy. Soc. Edinb., XXXIII, p. 361, Pl. XXI, Fig. 3.

[2] Fl. foss. Helv., p. 17, Pl. VI, Fig. 17.

[3] Verhandl. Nat. Hist. Ver. pr. Rheinl. u. Westfalens, XXV; Jahrg. 1868, p. 78.

d *Neuropteris laciniata* Lx. by its thinner, more delicate
om the former by its margin, fringed instead of jagged
small pinnules differ from *Neuropteris flexuosa* and *Neu-*
hylla, to both of which this species is closely allied, by
istant and its nervils fewer than in the latter and more
either.
ound in fragments of pinnæ and distorted pinnules from
haft and Hannam's shaft.

NEUROPTERIS SCHEUCHZERI Hoffm.

Scheuchzeri Hoffmann, in Keferstein, Teutschland, IV, p. 157,
igs. 1b–4. 1840: Jackson, Rept. Geol. Agricult. Surv. R. I., 1839,
Pl. v, Fig. 10. 1857: Kimball, Fl. Appal. Coal Field, p. 9, Pl. i,
1869: Schimper, Traité, i, p. 434. 1887: Kidston, Radstock Ser.,
l. xxiii, Fig. 1, 1a, 2.
Scheuchzeri Hoffm., Brongniart, Hist. vég. foss., p. 230, Pl. lxiii,
1882: Zeiller, in Barrois, Terr. anc. Asturies, p. 559. 1886: Zeiller,
houill. Valenciennes, atlas, Pl. xli, Figs. 1, 1a, 2, 3; text (1889),

angustifolia Brongniart, Hist. vég. foss., p. 231, Pl. lxiv, Figs. 3, 4.
acutifolia Brongniart, Hist. vég. foss., p. 231, Pl. lxiv, Figs. 6, 7.
cordata Brongn., Lindley and Hutton, Fossil Flora, i, p. 119, Pl.
7: Bunbury, Quart. Jour. Geol. Soc. London, iii, p. 423, Pl. xxi,
1a–f. 1853: Newberry, Annals Sci., i, No. 9, p. 106. 1865: (?)
Foss. Fl. Perm. Form., p. 100, Pl. xi, Figs. 1, 2. 1878: Dawson,
ol., 3d ed., p. 446, Fig. 166b. 1880: Lesquereux, Coal Flora, p. 91
1888: Dawson, Geol. Hist. Pl., p. 126, Fig. 51b. 1889: Lesley,
s. Penn., ii, p. 452, figure.
ton, Amer. Jour. Sci., xxix, Pl. xi, Fig. 26.
angustifolia Brongn., Foster, N. Jahrb. f. Min., p. 535. 1862:
itz, Dyas ii, p. 139, Pl. xxvii, Fig. 9. 1869: (?) v. Roehl, Foss.
kohlen. Westphalens, p. 33, Pl. xiv., Fig. 7. 1870: Lesquereux,
rv. Ill., IV, p. 467. 1879: Lesquereux, Coal Flora, atlas, Pl. viii,
3, 6, 8, 10, 11; text (1880) p. 89. 1880: Fontaine and I. C. White,
Flora, p. 17. 1883: Lesquereux, 13th Rept. Geol. Surv. Ind., Pt.
Pl. x, Fig. 1. 1884: Lesquereux, Coal Flora, III, p. 734. 1889:
Dict. foss. Penn., II, p. 451, figure.
cordata Brongn., var. *angustifolia*, Bunbury, Quart. Jour. Geol.
don, iii, p. 424. 1866: Dawson, Quart. Jour. Geol. Soc. London,
154.
hirsuta Lesquereux, Boston Jour. Nat. Hist., VI, No. 4, p. 417.
squereux, Geol. Surv. Ky., III, p, 534, 556, Pl. vi, Fig. 4. 1858:
eux, Geol. Penn., II, p. 857, Pl. iii, Fig. 6; Pl. iv, Figs. 1–16. 1860:
ux, Geol. Surv. Ark., II, p. 315. 1866: Lesquereux, Geol. Surv.
Paleont., p. 427. 1869: Schimper, Traité, I, p. 445. 1870: Les-
, Geol. Surv. Ill., IV, Paleont., II, p. 380. 1875: Dana, Manual
d ed., p. 327, Fig. 635. 1879: Lesquereux, Coal Flora, atlas, Pl.
gs, 1, 4, 5, 7, 9, 12; text (1880), p. 88. 1880: Fontaine and I. C.
Permian Flora, pp. 16, 17, 47, Pl. viii, Figs. 7, 8. 1881: C. A. White,
eol. Surv. Ind., 1879–'80, p. 152, Pl. ix, Figs. 1, 2, 3. 1882: Le
eol., p. 365, Fig. 473. 1883: Chamberlain, Geol. Wis., I, p. 216,
1887: Lesquereux, Ann. Rept. Geol. Surv. Penn., 1886, Pt. 1, p.
89: Lesley, Dict. foss. Penn., II, pp. 460, 461, 462, figures.

1855. *Neuropteris acutifolia* Brongn., Ettingshausen, Steinkohlenfl. Radnit
Pl. xviii, Fig. 5. 1876: (?) O. Feistmantel, Verst. böhm. Ablag.
64, Pl. xvii, Fig. 4. 1880: Fontaine and I. C. White, Permian Flor
1881: Weiss, Aus d. Fl. d. Steink., Pl. xiv, Fig. 89.
1857. *Neuropteris Rogersii* Kimball (non Lx.), Fl. Appal. Coal Field, p. 1
Fig. 1.
1884. *Neuropteris angustifolia* Brongn. var. *hirsuta* Lesquereux, Coal Flora, II

Fronds tripinnate, spreading, dichotomizing below; primary
large; primary rachis robust, lineate; secondary pinnæ altern
sub-opposite, oblique, lanceolate, or linear-lanceolate, somewha
tracted at the base, frequently overlapping; ultimate pinnæ alt
or sub-opposite, oblique or at right angles to the rachis, close
tant, sometimes overlapping, very caducous, and generally tri
consisting of a large oblong-lanceolate, lanceolate, or linear-lan
more or less obtusely pointed, entire, or undulate, often somewh
cate, short pedicellate median pinnule 3–11^{cm} long, having close
rounded or more or less auricular base one or two small som
polymorphous pinnules, the latter usually unequilateral, round
or reniform, but sometimes becoming double, enlarging into l
lanceolate or even digitate cyclopterid pinnules; ultimate pinn
ceeded above on the secondary pinnæ by large pinnules similar
median pinnules of the ultimate pinnæ, but sessile on the tho
attachment to the rachis, and more or less distinctly cordate, auri
or lobed at the base, the upper side rounded, the lower auricu
lobed, passing into the pinnate form; lower surface of the pi
generally provided with rather rigid hairs or bristles 1–3^{mm} in l
generally visible to the naked eye, scattered irregularly about, c
distant, and lying in various directions, but mostly in a direction
what parallel to the midrib, or the course of the nerves, often p
ing a dictyopterid effect; margins of the leaves usually slightly
backward; basilar or cyclopterid pinnules often naked, with ner
rather coarser than in the terminal pinnules and generally fla
from the base; primary nerve originating usually from a broad
pedicel, distinct in the terminal or long pinnules, though rathe
ascending three-fourths of the length of the pinnule or more
vanishing; nervils originating at a narrow angle to the midrib
ing gradually and dichotomizing three or four times before the
passed a little more than half way from the median nerve to the b
some of them forking a fifth time, thin, close, often undulating, u
more or less immersed in the epidermis, which is raised between
meeting the border somewhat obliquely, except in the lower p
the pinnules, and numbering thirty-five to forty-five per centim
the border.

This species is one concerning which great confusion has existe
ing many years; and while many paleontologists, including at on
Prof. Lesquereux, have been disposed to regard forms describ
Brongniart under the names of *Nevropteris Scheuchzeri*, *N. angus*
and *N. acutifolia* as ill-defined and belonging perhaps to the
species, an opinion first suggested by Brongniart himself, the qu
remained unsolved, for lack of sufficient material and a better k
edge of Brongniart's type, until Mr. Zeiller, in the course of his c
and exhaustive researches in the floras of the French coal fields,
a thorough and painstaking examination of Brongniart's speci

escriptions. To the invaluable investiga-
n the Museum d'Histoire Naturelle and by
ne British Museum, the Geological Society
ns, we are especially indebted for a knowl-
nd identity of these as well as many other
often imperfectly, by Brongniart and Lind-

mentioned forms as well as the variations
ng to each of the species that have been
are incidentally indicated in the following
elate to American material, are based on
f the U. S. National Museum examined
recorded in the "Register"—by Lesque-
the appearance of the first two volumes

is *Scheuchzeri* Hoffm.

scription of *Neuropteris Scheuchzeri*, Hoff-
irsute character of his species, both the
descriptions and the identification and
y various European paleontologists show
Neuropteris cordata described and illus-
and Bunbury, which in turn is proved
ongniart's types of *N. angustifolia* and *N.*
seem to have had access to Brongniart's
s not assured[2] of its identity with Hoff-
igure in the Histoire[3] agrees fairly well
d in Fig. 2 on Hoffmann's plate, or equally
ylvania figured as *Neuropteris Scheuchzeri*
Scheuchzeri as described and figured by
kesbarre, Pa., whence that author had
V. acutifolia, and he was disposed to con-
identical with *N. Scheuchzeri*, though it
so little material, consisting of isolated
ne Pennsylvania specimens described as
World forms is further indicated by a
tions and figures of foreign authors, es-
agnificent fragment of a pinna given by
adstock Series.[5]

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h-geologisch dargestellt, mit Charten und Zeichnungen
vol. IV, Weimar, 1826, p. 157, Pl. 1 b, Figs. 1–4.

öttingen, 1857, p. 9, Pl. I, Fig. 1.
p. 256, Pl. XXIII, Figs. 1, 2.

Neuropteris hirsuta Lx.

In his original description[1] of *Neuropteris hirsuta*, as well as
published with the illustrations in Rogers's Geology of Pennsyl
Lesquereux inscribes *Neuropteris angustifolia*, *N. acutifolia*, *N. S*
zeri, and *N. cordata* as synonyms, referring in the last case t
Brongniart's and Lindley and Hutton's works. In his remark
Lesquereux notes that "near the summit of the pinnæ the p
become simple, narrowly lanceolate (in which case they bel
Neuropteris angustifolia Brongn."), and that "*Neuropteris Sche*
Hoffm., sent to Mr. Brongniart from Wilkesbarre, belongs p
to this species also; nevertheless, we have never seen a leafl
the petiole attached to it as it is figured by this eminent author.
in the Coal Flora[3] the pinnules of this species are distinctly de
and figured as pedicellate when compound. He further add
"except the villosity the characters of this species are much lik
of the following [*N. angustifolia*], and in some cases it is very
to ascertain the reference of the leaflets generally found detach
the rachis and often mixed together;" and Schimper[4] was disp
accept the species, in default of a better definition of the other
on account of the presence of the hairs. Except the occurrence
hairs in *N. hirsuta* the only other distinctions between it and *N.*
tifolia that I am able to derive from the descriptions are a wid
nule, less acute for the former, while in the latter the pinnu
perhaps more distant, the midrib proportionately stronger and
ing farther up the pinnule, and the veins of the cyclopterid p
rather closer than in those of *N. hirsuta*. In *N. hirsuta* the
pinnules are "more rapidly narrowed upward, but never pointe
nerves counting forty to fifty per centimeter at the margin.

Among the specimens labeled *Neuropteris hirsuta* in the Muse
lection the following are examples: Number 1454, from Mazon
represents the lower part, $8^{\rm cm}$ long, of a pinnule $3^{\rm cm}$ wide, son
falcate, the borders parallel, rounded toward the base with
auricles near the pedicel, like those seen in *N. decipiens*.[5] The
is flat, $5\frac{1}{2}^{\rm mm}$ long, $2^{\rm mm}$ wide; the surface of the pinnule is hirsu
midrib and nervation exactly that of *N. decipiens* and counting t
eight to thirty per centimeter at the border. No. 1451 is a
$9\frac{1}{2}^{\rm cm}$ long, $2\frac{1}{2}^{\rm cm}$ wide, oblong-lanceolate, rather bluntly point
base broken; hirsute, external characters identical with the
nervation twenty-eight to thirty per centimeter. No. 1016, an
pinnule, $6\frac{1}{2}^{\rm cm}$ long, $2\frac{1}{2}^{\rm cm}$ wide, oblong lanceolate, rather acute
tip, somewhat narrowed below, auriculate, hirsute; 26 or 27 nerv
centimeter. No. 1450, ovate-lanceolate, $6^{\rm cm}$ long, $2\frac{1}{2}^{\rm cm}$ wide ne

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[1] Bost. Journ. Nat. Hist., VI, 1854, No. 4, p. 417.

[2] II, p. 857, Pl. III. Fig. 6; Pl. IV, Figs. 1–16.

[3] Vol. I, p. 88, Pl. VIII.

[4] Traité, I, p. 445.

[5] Coal Flora, III, Pl. XCIV, Fig. 2, terminal pinnule.

obtuse above, the base like 1454, distinctly pedicellate;
thin, dissolving in the upper quarter; hirsute; nervils
r centimeter. This pinnule has the outline and thin
teristic of the American *N. cordata*, as seen in speci-
nnelton, labeled by Lesquereux. The form is similar to
. *cordata* figured by Zeiller in the Commentry Flora, Pl.
, though the nervation is very different. No. 1452 con-
ent of the middle of a pinnule 32^{mm} wide, showing the
nervation of the Mazon Creek pinnules, the nervils num-
-eight to thirty per centimeter. No. 1455 is a linear-lance-
$8\frac{1}{2}^{cm}$ long, $2\frac{1}{2}^{cm}$ wide near the base, tapering upward to a
oint; base wanting; borders undulate; hirsute; nervils
thirty per centimeter. This specimen agrees in outline
al *N. hirsuta*. All of the above specimens said to belong
are from Mazon Creek. All have the same form and
the same number of nervils per centimeter on the margin
decipiens Lesq., described[1] as abundant at Mazon Creek,
ality a large number of specimens of the latter species
ipared. These specimens labeled *N. hirsuta* are said to
nder Lesquereux's hand since the publication of the de-
decipiens, from which the only distinction made seems to
innules of the latter are comparatively larger and the
-five to twenty-eight per centimeter on the border, but
examination and comparison I can find no character in
different from those seen in specimens in the same col-
. *N. decipiens*.[2]

r specimens labeled *Neuropteris hirsuta*, No. 2188, from
ına, represents the greater part, including the tip of a
te pinnule, $9\frac{1}{4}^{cm}$ long, 2^{cm} wide, tapering to a long slender
ınded at the apex. A fine midrib passes nearly to the top.
is distinctly hirsute; the nervils thirty-five to thirty-eight
. It appears to represent the form described by Brong-
gustifolia, though larger than his *N. acutifolia*, while it is
e as the latter. Another specimen with the same num-
ame locality, is linear-lanceolate, 7^{cm} long, the top wanting,
mewhat falcate, slightly contracted towards the base,
e upper half, the border undulate, rounded at the base,
xcellently with Brongniart's and Kimball's *N. Scheuchzeri*,
ıe midrib is not strong, and the pedicel, 3^{mm} long, $1\frac{1}{2}^{mm}$
round as Brongniart's figure represents. The nervils
ve to forty per centimeter. No 1290, from the Excelsior
long linear-lanceolate leaf $10\frac{1}{2}^{cm}$ long, 19^{mm} in greatest
at falcate, with a characteristic unequal base and pedicel,
rom the base to a rather slender acute tip, the extreme

733.

nfusion regarding this species is probably due to the fact that it was not fully
third volume of the Coal Flora was published.

apex slightly rounded; the slender midrib passes to near t
the margin is rather undulate; surface hirsute in portions;
thirty-five to thirty-eight per centimeter. This pinnule, which
form of *N. angustifolia* in Brongniart's plate, though more taper
more slender than his *N. acutifolia*, is much larger than any
slender acute pinnules that I have seen figured, the nearest illus
being that of *N. Scheuchzeri*, Fig. 2 of the Pl. XLI in the atlas to
Valenciennes flora. The specimen, identified in 1881 or 1882, app
contradict the statement in the Coal Flora that the pinnules of
suta are "never pointed." No. 1948 is a very interesting sp
from Wilkesbarre, the locality whence came some of Brongniart
mens of *N. acutifolia*. It agrees excellently with Brongniart's f
N. acutifolia, except that the upper side of the base is not so t
It is also comparable to Bunbury's Fig. 1c[1] of *N. angustifoli*
apex is fully as acute as in Brongniart's figure. The pinnule, v
over $7\frac{1}{2}^{cm}$ long and 20^{mm} wide, is densely hirsute. There can ha
any doubt of the specific identity of this specimen with that de
by Brongniart from the same locality. Two other fragments, N
from St. Clair, Schuylkill County, Pennsylvania, showing th
characters of nervation and apex, are less distinctly hirsute a
their nerves forty-one to forty-five per centimeter. Another sp
No. 1299*a* contains the greater part of a pinnule, including th
$6\frac{1}{2}^{cm}$ long, 18^{mm} wide, linear, distinctly hirsute, with thirty-six to
eight nervils per centimeter. The pinnule resembles somew
N. cordata figured by Lindley and Hutton, or still better the
marked *X* in Kidston's fine specimen[2]. The back side of the sa
contains an unlabeled upper portion of a large hirsute, lingul
tusely pointed pinnule, of exactly the form illustrated in Fig. 5,
of the Coal Flora. It is also characterized by elongated pits b
many of the nerves, which I take to represent perhaps the m
described and figured by Fontaine and I. C. White[3] as fructifi
of *N. hirsuta*. It is a suggestive fact that Brongniart also, in the
tion of *N. angustifolia*, notes "indications of fructification" b
the nerves, similar to the supposed fructification of *N. flexuosa*.
specimen of No. 2188, from St. Clair, contains fragments of seve
nules of the forms illustrated by Lesquereux in Rogers' Rep
Dr. C. A. White in Collet's Indiana Geological Report, 1879–18
The nervation is forty to forty-two per centimeter at the bord

Neuropteris angustifolia Brongn.

Brongniart, in his description of the *Nevropteris Scheuchze*
Wilkesbarre, Pennsylvania, observes[6] that these isolated p
might be from a different part of the same plant as the *N. angu*

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[1] Quart. Jour. Geol. Soc. London, III, Pl. XXI.

[2] Radstock Flora. Pl. XXIII, Fig. 1.

[3] Permian Flora. p. 47, Pl. VIII, Figs. 7, 8.

[4] Geol. Penn., II, 1858, Pl. III. Fig. 6.

[5] P. 152, Pl. IX, Fig. 1.

[6] Hist. Vég. foss., p. 230.

the localities making such a relation quite probable, but
difference in form made it necessary to consider them as
ıgh the disposition and fineness of the nervation were
possibility that *N. angustifolia* was only a variety or even
ther is again stated[1] on the following page in the de-
e latter species. No mention is made by that author of
of hairs on either species. It was singular and probably
hat Lesquereux, in his descriptions of Brongniart's *N.*
hose chief and sole important difference from *N. hirsuta*,
e (Coal Flora, I, p. 89), consisted in the absence of hairs
s, the nervation being the same, should have followed
ferring as a synonym to this smooth-pinnuled species
ordata from Cape Breton, which was both described and
ınctly hirsute.

rtant light on the question of the relation of these spe-
m Zeiller's examination of Brongniart's original speci-
pteris angustifolia and *N. acutifolia* from Wilkesbarre,
and near Bath, England, in which he has found both
e the same form and hairs characteristic of *N. Scheuch-*
t, in connection with the following notes on specimens
ıesquereux as *N. angustifolia* in the Museum collection,
that the fundamental and perhaps the only important
ween *N. hirsuta* and *N. angustifolia* as differentiated by
sts on a probable failure of observation or description.

but four specimens labeled *Neuropteris angustifolia* in
ollection. Of these No. 1017, from Mazon Creek, is an
ınceolate pinnule $6\frac{1}{2}^{cm}$ long, 20^{mm} wide below the middle,
tracted toward the base, which is auricled on one side,
th a moderately thick midrib passing well up into the
ich, though partially broken, was probably rounded; the
ndulate; the surfase is sparsely hirsute; the nerves 25
meter. No. 1017, from Mazon Creek also, is a bipartite
r to those figured by Lesquereux[3] as *N. hirsuta* and *N.*
It is divided to within 5^{mm} of the base, the midribs join-
on pedicel. The broader division is ovate lanceolate,
ne side at the base, obtuse at the apex, 4^{cm} long, 19^{mm}
r division is narrowly lanceolate, acute, slightly shorter,
wide. The nervils number 20 to 25 per centimeter, and
distinctly hirsute. Were the two parts detached one
rable, purely on account of its form, to *N. hirsuta*, while
the same reason, would probably belong to *N. angusti-*
e characters are so exactly those of *N. decipiens*, though

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t nous n'avons vu que des pinnules isolées, n'est peut-être qu'une variété de
ou peut-être n'est elle fondée que sur des folioles provenant de parties différentes
eur structure est la même; mais les pinnules sont constamment beaucoup plus
ne longueur à peu près semblable.
alenciennes, p. 254. See Atlas, Pl. XLI, Figs. 1–3.
IV, Figs 3, 4; Coal Flora, Atlas, Pl. VIII, Figs. 9, 11.

the form is not that described for the species, that they can ferred only to that hirsute species, which is so predominant in t posit, and with whose nervation they fully accord. The remaini specimens with this name are both from the original locality, V barre. No. 1946 is a linear fragment $6\frac{1}{2}^{cm}$ long and 18^{mm} wi apex and a portion of the base being lost. Enough remains to that the base is rounded on one side, while the upper portion gradually; the margins are undulate; the nervation, which is tinguishable from that seen in No. 1290 (*N. hirsuta*), is very like that seen in some specimens of *N. cordata* from Cannelton nervils count 36 to 40 per centimeter. The specimen has the tions and appearance of Hoffman's Fig. 3. Portions of the pinn clearly hirsute. The other specimen bears the same number. It sents the lower 5^{cm} of a lanceolate pinnule 21^{mm} wide. The thi rib runs well up, the undulate sides are rounded toward the pedi base. The specimen is nearly a counterpart of Brongniart's fi *N. Scheuchzeri*, except that the midrib is not so strong and distin comparison by other European authors of his figures with the has taught that the figures are not always trustworthy. The tion is still closer to that of the Cannelton specimen—42 to centimeter. Numerous fragments of other pinnules on the sam show the proportions of the *N. hirsuta*, in Pl. VIII, Fig. 5, of th Flora, the upper part tapering to a rounded tip, the basal portio cellate and auriculate. The auricular lobes often seen in the b these forms, as well as in *N. decipiens* and *N. cordata*, have the r sinuses running upward along the pedicel, like that seen in Pl Fig. 2, of the Coal Flora, and Bunbury's Fig. 1c. Nearly all th ments are plentifully supplied with distinct hairs. The first tw mens were identified by Lesquereux in 1881, the last two in 188

It was not, I believe, until 1870[1] that Lesquereux removed *N.* *tifolia* from the synonymy of *N. hirsuta*, remarking that "the s of the leaflet is smooth, without hairs; the veinlets somewhat and not quite as distinct as in *hirsuta*," though he thought it mig be only a form of *N. hirsuta*. The difficulty often experienced in distinguishing between the two forms, expressed in 1880,[2] is furt dicated in the discussion of the pedicels of the terminal pinnules o two species, when, in describing *N. hirsuta*, he says: "It is pr upon one leaf of this kind that Brongniart made his species, *N. S* *zeri*, Hist. d. Vég. foss., p. 230, Pl. LXIII, Fig. 5. The charact exactly those of *N. angustifolia*, a species commonly found at V barre, wherefrom the author received the American specimen w refers to it." Three pages farther in the volume a statement esse the same is made with reference to *N. cordata*. The third vol the Coal Flora contains a note on a "variety" of *N. angustifolia*

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[1] Geol. Surv. Ill., IV, p. 467.

[2] Coal Flora, p. 89.

sage City, Kansas, with leaflets hirsute, like those of *N. hir-*
ave a broad, deep percurrent medial nerve, with oblique,
k, lateral nerves counting thirty-five to forty per centimeter
It was then regarded as midway between *N. hirsuta*
ns. This is probably the variety referred to in the table,
, as *N. angustifolia* var. *hirsuta*, whose sole distribution
bove mentioned localities. I am wholly at a loss for any
ing why the presence of the hairs on the specimens from
ates identified by him as *N. angustifolia* should not have
d.

ation of the authentic specimens in the Museum labeled
shows (1) that most of those marked *N. hirsuta* are more
th a much more acute tip, than the specimens figured by
hat the apparent difference between the *N. hirsuta* and the
ked *N. angustifolia* lies in the fact that the latter name
pplied to those narrower pinnules on which the hairs are
The nervils, counted at the border, do not average less
lia than in *N. hirsuta*. Among the narrower pinnules of
belong those identified as *N. angustifolia* by Brongniart;
, by Jackson;[1] *N. Rogersii*, by Kimball,[2] the relation of
VIII, Fig. 8, of the Coal Flora, or Pl. IV, Fig. 5, of the
Geology, is at once apparent; Ettingshausen's *N. acuti-*
ry's Fig. 1 B; the *N. hirsuta* figured by Dr. C. A. White,[4]
heuchzeri illustrated by Zeiller in the Valenciennes Flora.[5]

Neuropteris cordata.

ecies quite misunderstood in this country is that identified
Brongn. Of this Prof. Lesquereux says:[6] "It seems to
f *N. angustifolia*, from which it differs essentially by the
nal leaflets." The nervation and the form of the pinnules
as being the same as in *N. angustifolia*, both species
the same locality, where in many cases *N. hirsuta* was

f a large series of specimens of *N. cordata*, identified by
the Museum collection, reveals outlines common to both
N. decipiens. The pinnules generally have their lateral
er more rounded than in the above-named forms, but
ar-lanceolate, though slightly more obtuse, and as a rule,
qual at the base. It differs somewhat in nervation from
; the midrib, rather strong at the base, vanishes above
r passes into the apex. The nervation often resembles

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[1] Rept. Geol. and Agricult. Surv. R. I., 1839 (1840), Pl. v.

[2] Fl. Appalachian Coal Field, Pl. I, Fig. 2.

[3] Steinkohlenfl. Radnitz, Pl. XVIII, Fig. 5.

[4] Indiana Geol. Rept., 1879-'80, Pl. IX, Fig. 2.

[5] Atlas, Pl. XLI, Figs. 2, 3.

[6] Coal Flora, p. 92.

closely that of the Wilkesbarre specimens of *N. Scheuchze*
very fine, and nearly as close near the midrib as at the borde
it is 40 to 50 per centimeter. It is difficult to distinguish som
specimens from *N. Scheuchzeri*, and an examination shows
cases (cf. Nos. 1083, 1084, 1084*a*), probable errors in identificat
identity in form, texture, nervation, and hirsuteness with that
However, most of the specimens have their nervation rath
more evenly embedded in the parenchyma, and the surface
appearing to constitute a distinct variety, if not a separate sp

The specimens described by Lindley and Hutton[1] as *N.*
Brongn., referred to by Lesquereux in the synonymy, have p
examination by Kidston to be, like Bunbury's, hirsute and ide
all respects with *N. Scheuchzeri.* On the other hand, altho
type of Brongniart's figure is lost, Zeiller has found many s
in the Museum at Paris labeled by Brongniart, some of whicl
true *N. cordata* figured in the "Histoire," while others are *N.*
zeri. The true *N. cordata* of Brongniart as newly described by
although resembling many of the Cannelton specimens in f
proportions, has the pinnules smooth, the midrib hardly mor
line, and the nervils distant, counting only eight to fifteen p
meter.[3]

It may be noted also in this connection that Kidston an
unite in referring F. A. Roemer's hirsute *Dictyopteris cordata*
Scheuchzeri founded on Brongniart's *N. cordata*, and Hoffm
Scheuchzeri, respectively, to be the true *Neuropteris Scheuchzer*
Should this reference prove valid, the plants identified and
described, without illustration, by Lesquereux in the third v
the Coal Flora[5] as *Dictyopteris cordata* and *D. Scheuchzeri*, need
species, to be more fully described and figured under other nam
undulation of the nervils, in *N. Scheuchzeri*, frequently simulat
tomosis, was pointed out by Lesquereux. It is well illustrat
specimens No. 2188, described above.

The synonymy of the names correlated with *Neuropteris Sch*
Hoffmann affords a good illustration of the fallibility, frequentl
tive evil, of identifying American species with those in a differen
phere solely on the basis of their agreements with descripti
figures (often imperfect, incomplete, or misleading), without ha
course to actual authentic specimens for comparison.

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[1] Fossil Flora, p. 118, Pl. XLI.

[2] Fl. Foss. Commentry, p. 237, Pl. XXVII, Figs. 6–10; Pl. XXVIII, Figs. 1, 2. Fl. Fos
Épinac, p. 150, Pl. XI, Fig. 5.

[3] Mr. Lacoe informs me that in unpublished manuscript Prof. Lesquereux removes
described as *N. cordata* Brongn. in the Coal Flora, declaring it to be probably new, and
later found the true *N. cordata* Brongn. with distant nervation, and also typical *N.*
Before completing the study of this group the health of the lamented pioneer and elabo
study of our Carboniferous flora became so impaired that he never so far advanced the m
to rename the Cannelton species.

[4] Palæontogr., IX, 1860, p. 30, Pl. VI, Fig. 4; Pl. IX, Fig. 1. See von Roehl, Foss. Fl. Steinh. W
pp. 49, 50, Pl. XXI, Fig. 12 (?); Pl. XV, Fig. 6; Pl. XXI, Fig. 7*b*.

[5] Pp. 832, 833.

Neuropteris Clarksoni Lx.

tly difficult to distinguish between some of the pinnules
. *Clarksoni* and such of the more narrow and acute pin-
ieuchzeri as have not been preserved so as to show the
istration of this is seen in a specimen from Cannelton, No.
iseum collection, labeled *Neuropteris Clarksoni*. It con-
ire pinnule, linear-lanceolate $10\frac{1}{2}^{\mathrm{cm}}$ long, falcate, tapering
ard to a slender point, which is slightly rounded at the
is at the base, which is sublobate, 31^{mm} in greatest width,
auriculate and broadly pedicellate. This dilation of the
greater than that I have seen in any specimens of *N.*
comparable to what is seen in the *N. Clarksoni*, figured
Rogers's Report.[1] The upper portion of the pinnule is
, size, and nervation to that seen in specimens No. 2188
ribed above under *N. hirsuta*. The secondary nerves
less distant near the thin midrib than is characteristic of
the margins are undulate and the surface clearly hirsute
ts area. Another specimen, labeled *N. Clarksoni*, No.
from Wilkesbarre, linear-lanceolate, somewhat falcate
long, 16^{mm} wide, tapering, but not quite so acute as in the
s rounded, characteristic of *N. Scheuchzeri*, auriculate and
nerves count thirty-eight to forty per centimeter; the
irface are easily visible to the naked eye. Both species
o *N. Scheuchzeri*, No. 1947, representing the form known
lia. In the true *Neuropteris Clarksoni* of Lesquereux, as
many specimens in the Museum the pinnules, which are
e generally more narrowly acute, without basal cyclop-
, the auricles round and frequently overlapping at the
an nerve rather broad at the base, thinning gradually to
erves in relief, much farther apart near the midrib and
ider angle, arching towards and often forking near the
they meet nearly at right angles in the lower part, num-
-eight to thirty-four per centimeter at the margin. It ap-
be quite a different species from *N. macrophylla* Brongn.,
ton[2] has referred it.

Neuropteris fasciculata Lx.

pecimens identified by Lesquereux in the Museum collec-
me interest on account of their relation to our species.
1183 is the lower $6\frac{1}{2}^{\mathrm{cm}}$ of an oblong lanceolate pinnule,
equally rounded, and pedicellate. The lower portion is
apressed. The texture and nervation, twenty-five to
er centimeter at the margin, are identical with that in No.
escribed above. No. 1181*a* contains the middle 6^{cm} of a sim-

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[1] Geol. Penn., vol. II, 1858.

[2] Foss. Fl. Radstock Series, p. 354.

ilar pinnule, 3^{cm} wide, tapering and rounding gradually toward t the nervils twenty-six to twenty-eight per centimeter. Both specimens are labeled *Neuropteris fasciculata* Lx. But the cha in these specimens are in every respect, including the hairs, wl strong and visible to the naked eye, identical with those of the *N* *ens* from the same place, to which only the pinnules can be referre *Neuropteris fasciculata* is described[1] as "evidently distinct fr last species [*N. hirsuta*], as is shown by its smooth (not hairy) s though the veins are said to be "about at the same distance *decipiens*." These two specimens, with their counterparts, are t ones in the Museum labeled by Prof. Lesquereux as belongin *fasciculata*. Their indisputable identity with *N. decipiens*, ta gether with the fact that they come from Mazon Creek, where the types described and figured by Lesquereux were found an the latter species is abundant, casts suspicion on the entire *N. fasciculata*. It is probable that both this species and *N.* need a careful examination.

CONCLUSIONS.

My present observations warrant no claim to a final solut differentiation of the vexed questions concerning the identities lationships within this group of Neuropterids. The following sions may therefore be true only so far as they relate to the inc suites of specimens now in the Museum collection.

From the foregoing citations and notes it appears that the A types described and figured by Brongniart as *Nevropteris Sche* *N. angustifolia*, and *N. acutifolia* are all fragments of the sa and that all possess the hirsuteness which constituted the dis character of *N. hirsuta;* and that *N. hirsuta* is specifically inse from *N. angustifolia*, identified and described as smooth, though found at the same localities with the other. The identity of th ican forms with the European fern *N. Scheuchzeri* is based p the comparison of American specimens in France by Brongni Zeiller, and the identification of the Cape Breton and British with the same species by Kidston. So far as the writer has b to consult authentic specimens identified by Lesquereux, it also that the American *N. angustifolia*, like Brongniart's original, f same locality, reveals, on a careful examination, the same cha including the presence of hairs, as *N. Scheuchzeri*, to whose n pinnules, with less conspicuous hairs, the name *N. angustifoli* to have been applied. With reference to *N. cordata* it is seen tha tion of the specimens, slightly differing in form, and with a less de vation, identified by Lesquereux under this name, are indisting in nervation and hirsuteness from *N. Scheuchzeri*, to which they referred, while the American *N. cordata*, as separated by Lesq with a dense and more uniform nervation, is a distinct specie

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[1] Geol. Surv. Ill., vol. IV, p. 382, Pl. V, Figs. 1-4. Coal Flora, p. 93, Pl. XXIV, Figs.

adically different from the true *N. cordata* described
Brongniart.
collections of the U. S. National Museum are concerned,
is possibly true in other collections, it is quite clear
mens in the concretions from Mazon Creek, Illinois,
squereux as *N. hirsuta*, are inseparable on any charac-
cipiens, Lx., all having the characteristic forms, text-
tion (counting twenty-four to thirty per centimeter on
the latter species, while the nervils of the less robust
euchzeri, with generally narrower and more acute pin-
ot less than thirty-four or thirty-five, and usually thirty-
e, per centimeter at the border. Also that those speci-
europteris fasciculata Lx., in the Museum, from the same
ical in structure, disposition, including hirsuteness, and
Neuropteris decipiens, indicating in that species the
obate cyclopterid pinnules similar to those known in
thus rendering the intimate relationship of these two
re apparent.
e between the more narrow and acute pinnules of
euchzeri and certain forms of *N. Clarksoni* is very
specimens of the former species having been identified
ler the latter name, although *N. Clarksoni* is, in general,
nd well differentiated. It would not be invariably safe
t the fact that a pinnule is hirsute is itself sufficient
elongs to a species characteristically hirsute as ordi-
; neither should all the large linear-lanceolate *Neurop-*
at are provided with hairs or bristles be united in the
Fontaine and I. C. White report that the hirsute char-
uta is almost never seen in the upper beds of the Upper
es.[1] Moreover, the degree of hirsuteness, or even the
, may have been affected by environment, and this may
ight consideration as explaining the occurrence or ab-
n specimens otherwise identical, though it may be gen-
e circumstances of preservation.
lecipiens may represent only a robust variety of *N.*
which it is in habit, form and nervation very closely
broader, more oblong pinnules rounding up to an ob-
apex, the hairs generally stronger, the midrib generally
base, the more open nervation near the median nerve,
t limit of the nerves, twenty-four to thirty per centi-
rgin, mark it as specifically distinct from *N. Scheuchzeri*,
en above (2188, 1290, 1290a, 1948, 2185, 1946, 1087, and
closer from the midrib outward, numbering thirty-five
centimeter at the margin.
undant in the shales from Hannam's Shaft, Carterville.

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[1] Permian Flora, p. 47.

NEUROPTERIS JENNEYI n. sp.

Pl. I, Fig. 7a, 7b; Pl. II, Figs. 7-12; Pl. III, Figs. 1-6, 6a, 7-10.

Fronds tripinnate; primary rachis irregularly but distinctl
primary pinnæ broad, tapering above to an acute tip, the port
the secondary pinnæ being simply pinnate, with distant ovate-la
slightly triangular, obtusely-pointed pinnules 12^{mm}–4^{cm} long
wide, cordate at the base, the lowest ones short-pedicellate, t
ones sessile, becoming decurrent and confluent at the base to
apex of the pinna, which is deeply lobed and sinuate, without
terminal pinnule; secondary pinnæ alternate or subopposite
distant but sometimes contiguous, very caducous, open, obliq
flexed, lax, ovate or linear-lanceolate, $3\frac{1}{2}$–13^{cm} or more in lengt
averaging about $2\frac{1}{2}^{cm}$, in width, the uppermost trifoliate, the n
pinnules increasing in the pinnæ below, the apex of each pinn
ing of an elongated pinnule, the lower part of which is sublo
current, and crenate, the middle third straight or slightly c
with parallel borders, the upper third tapering in lobes, becomin
late, or, most commonly, crenate or deeply crenate toothed a
rather acute apex; secondary rachis very lax, ribbon-like; pi
the secondary pinnæ caducous, alternate or subopposite, dista
ovate, or oval-lanceolate, 6–21^{mm} long, 4–16^{mm} wide, with
slightly reflexed, the lowest slightly auriculate and short pe
those next becoming sessile by a narrow attachment to the la
then sessile and contracted at the base, the higher ones decurre
near the top obovate, odontopteroid, united at the base, pass
shallower sinuses, into the terminal pinnule; upper rachial
broad, deltoid, cordate, lobate-auriculate, obtusely pointed, 18
more in length, 17–29^{mm} or more in width, often with short, br
cels; lower rachial pinnules asymmetrically cordate, sessile b
attachment, distant or contiguous, acuminate or obtusely
4–6^{cm} long, $2\frac{1}{2}$–$5\frac{1}{2}^{cm}$ broad, or more or less orbicular or orbicul
$3\frac{1}{2}$–5^{cm} or more in the longer diameter, $2\frac{1}{2}$–4^{cm} or more in the
with broad or partly clasping attachment; primary nerves th
upper, simple pinnules of the pinnæ hardly passing beyond th
third, the secondary nerves, often thickened at the base, origi
a very narrow angle, those in the lower portion of the pinnul
ing directly from the rachis, flabellate, forking four or five t
narrow angle, arching to nearly a right angle to the border, w
count thirty to thirty-eight per centimeter; pinnules of the secon
næ without a well-defined midrib, all the nerves and nervils appe
bellate from the base in the oval pinnules, being developed fro
bundle passing from the base of the leaf down the rachis; nervil
distinct, slightly thinner at the margin, where they number twen
thirty-five per centimeter; each lobe and crenulation of the
pinnule fed from a single bundle diverging from the axis of th
primary nerve of the rachial pinnules thin or entirely wanting
ary nerves usually stronger near the base, passing flabellately
more or less, to the border, at which they count about thirty-t
centimeter.

The fronds of this species are unique as well as beautiful.
the delicacy of the ramification and the lax texture of the ri
rachis of the ultimate pinnæ, the latter are not only almost i
detached, but the lower portions of the secondary pinnæ a

t are so far developed as to be constricted at the base are
tached. Consequently the fern is represented, in by far
number of the specimens, merely by the lower part of the
nules of the secondary pinnæ, with the preceding more or
and decurrent pinnules, as seen in Pl. III, Figs. 1, 2, 5, 6,
e fragments are Odontopteroid in outline, suggesting *Odon-*
iloba.[1] In these pinnules, as well as in those in the lower
innæ, the nervation of each pinnule is seen to differ from
topteris by its origin in a single vascular bundle, curving
he axis of the pinnæ at a very acute angle, and passing
rable distance downward alongside of or contiguous to
axis. This is imperfectly indicated in Pl. III, Fig. 6. In
vhich I have observed this bundle continues on until that
ceding pinnule in its turn comes down close by its side,
ntly each is seen to continue for a time as an independent
loose rachis. It is to this lax rachial constitution that I
h the frequent splitting of the rachis, Pl. I, Fig. 7*b*, and
variable separation of all the pinnules that have not a suffi-
l limb attachment to retain them in position. It may also
he loose flexuous attitudes of the fragments of pinnæ in a
the other fern remains are normal. In rare cases, how-
hial axis is somewhat thick and rounded in the lower
terminal pinnules in these secondary pinnæ, as seen in
, perhaps remaining thin and sharp in passing downward,
cases the secondary nerves lie close to the axis for some
re they become lost therein, while lower down the rachis
n thin and correspondingly delicate. The pinnules on the
æ and rachis are plurinerved from the base. The forms
dary pinnules are illustrated in Pl. III, Figs. 1, 5, and 6.
t will be seen that while the secondary terminal pinnules
ceolate and rather obtuse, as seen in Pl. III, Fig. 3, in the
pinnæ, in the more advanced stages the margins are
ht or slightly sinuate in the middle, becoming crenulate,
renulate-dentate toward the tip, as seen in Pl. III, Figs. 7
ure unknown, I believe, in any other species of *Neuropteris*.
lobes, like those below the middle, are each fed from a single

n of the broad deltoid pinnules, such as Pl. II, Figs. 7, 8, 11,
e secondary pinnæ, Pl. III, Fig. 6, is not definitely known
rom their obvious resemblance, their tendency towards
l the occurrence of a few specimens intermediate between
e simpler primary pinnules, Pl. II, Fig. 9, I am inclined to
as simple pinnules on the primary rachis, occurring per-
n the secondary pinnæ, the larger and broader ones being
rer the base of the frond. One specimen in the collection

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[1] See Weiss, Flora d. jüngst. Steink. u. Rothl., Pls. II, III.

shows two pairs of pinnules, of nearly the type and size of thos
II, Fig. 9, placed opposite on a rachis less than $1\frac{1}{2}^{mm}$ in width, th
pair being preceded on one side by a small pinna. Similar
pinnules between the secondary pinnæ are seen in other sp
Neuropteris, such as *N. auriculata*, *N. Scheuchzeri*, and in *Odon*
lingulata (*O. obtusiloba*), whose secondary pinnæ are also sugge
ours.[1] None of these triangular sublobate pinnules have been
direct connection with the common form of larger secondary
The connection of the largest of the cordate or deltoid pinnul
larger fragments of rachis establishes their relations and brin
into comparison with the rachial pinnules of *N. auriculata* and *N.*
of Lesquereux.[2] These have a broad attachment, perhaps p
clasping the rachis. Their nervation is more or less flabella
nerves sometimes thickened below, forking 4–6 times and c
about thirty-four per centimeter at the border.

Relations.—In form and habit *Neuropteris Jenneyi* is somewha
mediate between *Neuropteris* and *Odontopteris*. The simple p
near the end of the primary pinnæ, and the smaller oval pin
the secondary pinnæ closely resemble the group of trifoliate sp
Neuropteris, including *N. Scheuchzeri*, *N. cordata*, and *N. d*
The basal pinnules of these species, however, are not so elonga
is the origin of the pinnular nervation the same. The nervatio
first two is also closer than that of *N. Jenneyi*. The upper pin
the secondary pinnæ are most like those seen in *Odontopteris li*
though the nervation of each pinnule, when carefully examined
to spring from a single bundle. The rachis of *O. lingulata* is th
the terminal pinnules, while more or less undulate, are rounde
tip, not deeply dentate, as in our species. The middle of the t
pinnule of our species is much like that of *O. lingulata* and *O. W*
but is more sublobate, crenulate, or sinuate, without the strong
nerve of the others, while its tip has its only homologue in th
Wortheni,[3] whose pinnæ especially suggest ours in their habit, a
they are hirsute and deeply lobate at the apex, not roundly
with rounded sinuses, as in *N. Jenneyi*, in which the dentition c
to the more or less acute point. The rachial pinnules a
uniformly deltoid and cordate than those of *N. auriculata*
Scheuchzeri (*N. hirsuta* Lx.) without the distinct median ner
Clarksoni, and not so distinctly pedicellate as, and generall
triangular than, those of *O. lingulata*.

Locality.—McClelland's shaft, where it is the most abundant
also present among the species from the Hannam shaft.

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[1] Weiss, Flora d. jüngst. Steink. u. d. Rothl., p. 3*a*, Pls. II, III, VI, Fig. 12. See also *O.*
Steininger, Geogn. Beschr., Fig. 3; Goeppert, Gattungen. Lief. 5, 6, Pl. VII, Fig. 1; and *O*
Naum. Geinitz, Dyas, II, Pl. XXVII, Figs. 1–4; Pl. XXIX, Figs. 1–4, 8–10.

[2] Geol. Surv. Ill., Vol. II, Palæont., p. 427, Pl. XXXV. Figs. 8, 9.

[3] Lesquereux, Geol. Surv. Ill., II., Palæont., p. 432, Pl. XXXVI, Fig. 1; Coal Flora, I, p. 1
Fig. 1.

NEUROPTERIS RARINERVIS Bunb.

Pl. v, Fig. 7, 6?.

s rarinervis Bunbury, Quart. Jour. Geol. Soc. London, iii, p. 425,
i, Figs. 1, 1a, b. 1858: Lesquereux, Geol. Penn., ii, p. 859. 1860:
reux, Amer. Jour. Sci., 2d ser., xxx, p. 68. 1863: Dawson, Can.
ii, p. 443. 1866: Dawson, Quart. Jour. Geol. Soc. London, xxii, p.
366: Lesquereux, Geol. Surv. Ill., ii, Palæont., p. 428, Pl. xxxiii,
5; Pl. xxxiv, Figs. 1, 1a. 1869: Schimper, Traité, i, p. 440; (1874),
74. 1870: Lesquereux, Geol. Surv. Ill., iv, 2, p. 386, Pl. viii, Figs.
71: Dawson, Rept. Geol. Struct. Min. Res. P. E. I., p. 44, Pl. ii, Fig.
9: Lesquereux, Coal Flora, atlas, Pl. xv, Figs. 2–5; text (1880), p.
80: Fontaine and I. C. White, Permian Flora, pp. 16, 20. 1881: Les-
, Rept. Geol. Ind., 1879–'80, p. 152, Pl. x, Figs. 1, 2, 3. 1885: Dawson
n, Can. Rec. Sci., i, p. 158. 1886: Kidston, Cat. Pal. Pl. Brit. Mus.,
1887: Lesquereux, Proc. U. S. Nat. Mus., x, p. 24. 1887: Kidston,
Radstock Ser., p. 361. 1888: Dawson, Geol. Hist. Pl., p. 274. 1888:
, Trans. Roy. Soc. Edinb., xxxv, pt. 1, p. 321.
s heterophylla Brongn., Zeiller, (pars) Vég. foss. terr. houill., atlas,
iv, Fig. 2; text (1879), p. 49.
s rarinervis Bunb., Six, Ann. Soc. géol. Nord, xi, p. 208. 1883: Zeil-
l. Soc. géol. Fr., (3) xii, p. 197. 1886: Zeiller, Fl. foss. Valenciennes,
l. xlv, Figs, 1, 1a, 2, 3, 4, 4a; text (1888), p. 268.

y large, polypinnate, primary and secondary rachis thick,
tomous, often bearing, at or near the forks, sessile oval
innules, sometimes orbicular or cordate at the base; pin-
or subopposite, open or oblique, broad or triangular in
apping one another, bipinnate in the greater part of their
y pinnate toward the tip; ultimate pinnæ alternate or sub-
n or oblique, sometimes slightly arched upward, linear or
ate, with borders touching or overlapping, contracted to-
ex, and obtusely pointed; pinnules alternate, open or
nt or overlapping, rather small except at the top of the
næ, flat or slightly arched at the borders, sessile, some-
at the top of the pinnæ, cordate at the base, occasionally
portion of the base to the rachis in the upper part of the
g, the borders parallel or gradually narrowed upward to
r rounded apex; terminal pinnule larger, comparatively
at hastate, cuneate below, usually sublobate, contracted
part, lanceolate, often slightly undulate, rounded at the
trong, appearing as a furrow on the upper side of the pin-
eneath, passing nearly to the apex of the leaf; secondary
often appearing double, sometimes in relief on both sides
es, springing at a narrow angle from the midrib, arched,
r three times into thick, distant nervils; nervation of the
innules flabellate, coarse, often appearing double.

s, well known on this continent, where it was discovered,
n definitely recognized in France by direct comparison of
y Zeiller, and in Great Britain by Kidston. Zeiller
fronds of the very fine specimens which he has examined
zing below, their general habit being nearly the same as

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[1] Fl. foss. houill. Valenciennes, p. 270.

that of *N. heterohpylla*, only smaller in its development. Lesquere describes fragments of the rachis, $3\frac{1}{2}^{cm}$ broad, covered with cyclopteri pinnules 7–8^{cm} in diameter, nearly round. The middle ultimate pinn are quite slender, averaging about 10^{cm} in length, those lower dow becoming much longer, while the uppermost are but little over 2^{cm}, slightly longer than the large pinnules succeeding them on the prima rachis. Frequently the margins are more or less crenulate or und late. The leaf substance is quite coriaceous, especially in the larg pinnules. The length of the pinnules varies from about 3^{mm} in the sma est to 22^{mm} in the larger, which are somewhat contracted in the upp part, the average length being about 9^{mm}, while the width, varying fro 2 to 6^{mm} or 7^{mm}, averages about $4\frac{1}{2}^{mm}$. The nerves fork usually twi arching to the border, where they average about twenty-six to the cen meter in the larger pinnules, eighteen to twenty per centimeter in t smaller. The cyclopterid pinnules have been seen as long as 8^{cm} a as wide as 10^{cm}. Sometimes they are orbicular, clasping the rach more or less, or cordate, while in other cases they are lateral, varying outline, frequently appearing more or less cuneate at the base, a rounded above, as illustrated by Prof. Lesquereux.[1] Of the cyclopter pinnules that I have figured, that represented in Pl. v, Fig. 7, see to me to be referable to this species. It is incomplete on the left a above. The lower portion approaching the point of attachment arched outward, the surface still partly covered with the thick co aceous substance of the leaf, on which the coarse nerves appear double lines, as represented in the figures published by Lesquere It occurs in association with the pinnæ of this species.

Zeiller[2] and Kidston[3] refer *Neuropteris coriacea* of Lesquereux (n Ettingshausen) to *N. rarinervis*. It is true that the same form of p nules and arched secondary nerves which were among the distinguis ing characters of *N. coriacea*, according to Lesquereux's descriptio are seen in the Museum specimens of *N. rarinervis* as well as in th examined or figured by the European authors. Also some of the larg leaves of *N. rarinervis* show a thick texture and marked impression the rock. But I have not yet seen specimens of our species with t minal pinnules twice as broad, and deeply lobed above the middle li that described under *N. coriacea*, as a differentiating character. Son of the terminal pinnules figured by Bunbury[4] would seem to approa it more closely. The union of these two species, which was first su gested by Zeiller, should not be effected without comparing exampl of the less known species. Mr. Kidston also combines *N. Desorii* wi *N. rarinervis*, having found fine specimens of the latter in Wales, " which," he says[5] "all the forms of pinnules which Lesquereux has me

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[1] Rept. Geol. Surv. Ill., IV, 1870, Pl. VIII, Fig. 5. Coal Flora, Pl. XV, Figs. 3, 4, 5.

[2] Op. cit., p. 269.

[3] Cat. Pal pl. Brit. Mus., p. 91.

[4] Quart. Jour. Geol. Soc. London, III, 1847, Pl. XXII, Fig. 1a.

[5] Op. cit., p. 92.

urring in his *N. coriacea* and *N. Desorii* can be seen." An
of specimens in the collections of the Museum seems to
ction of Lesquereux in separating *N. Desorii* from *N. rari-*
e from the peculiar deeply lobed, irregularly divided,
cyclopterid pinnules, much more closely nerved than the
les of *N. rarinervis*, and the broadly triangular undulate
nial pinnules descibed and illustrated as proper to *N. De-*
xist several other more or less conspicuous characters dis-
e latter species. In *N. Desorii* the pinnules of the longer
re often opposite or subopposite, those in the lower part
being at a considerable distance from each other, while
up approach one another gradually until they become
wholly united, forming a lobate or undulate tip of the
it any distinction of a terminal pinnule.[1] The small lat-
e nearly like the tips of the larger pinnæ, only less deeply
rule the large pinnules of this species are more tapering,
, and undulate to the tip, the thin midnerve also waving
th the marginal undulations. The small pinnules are
re rounded, with a more gradual transition through the
of the pinnæ to the tip. The nerves of the larger pin-
ong at the base, becoming thin and round in passing to
here they count from thirty-six to forty-two to the centi-
in the smaller pinnules there is no distinct midrib, or, if
on disappears, the nerves at the margin numbering thirty
per centimeter. In both the large and small pinnules the
omewhat irregularly lax, as is well illustrated in Pl. XIV,
Coal Flora.

-The relations of *Neuropteris rarinervis* to *N. coriacea*
in doubt, but the latter is described as differing by its
and shorter terminal pinnules. Its difference from *N.*
inted out above. It is dissimilar to *N. heterophylla* in
nnules usually smaller, the nerves much thicker, fewer,
otomized. *N. Smithsii* has much smaller pinnæ and pin-
ter distant, oval, or round, with sharply defined midrib,
erves much closer, usually forking but once and meeting
right angles.

McClelland's shaft.

NEUROPTERIS CAUDATA n. sp.

Pl. IV, Figs. 1–9.

pinnate, rachis coarsely striated, primary pinnæ broad,
ring toward the apex to a rather acute tip; secondary
ate, sometimes subopposite, linear-lanceolate, $2–20^{cm}$ long,
t right angles to the primary rachis or oblique, straight or
ılarly, the sides nearly parallel in the middle, converging

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[1] See Coal Flora, Pl. XIV, Figs. 4, 7, Pl. XV, Fig. 1.

gradually near the top to a lanceolate, obtusely-pointed tip, sometim
contracting toward the base, which often bears a pair of elongated p
nules; secondary rachis distinctly striate; secondary pinnæ succeed
near the apex of the primary pinnæ by large, narrow, rather elonga
triangulate, lanceolate, acute, or acuminate pinnules, 9^{mm}–4^{cm} long, 2
2^{cm} wide, the lower ones attached by a narrow portion of their bases, t
upper becoming attached by their whole bases or even decurrent; p
nules somewhat coriaceous, alternate, at right angles and generally cl
or overlapping below, becoming oblique, touching and usually more d
tant in the middle and upper parts; those of the secondary pinnæ rat
oblong, 7^{mm}–4^{cm} long, 2–18^{mm} wide, but in both the secondary and p
mary pinnæ rounded or round-auriculate at the base above the po
of attachment, which is about $1\frac{1}{2}^{mm}$ wide toward the base of the pin
attenuate-auriculate below the attachment, the lower angle prolong
downward in a rather flexible, acuminate, spur-like appendage exte
ing down beneath or over the preceding pinnule, frequently crossi
the median nerve of the latter; margins of the pinnules of the secon
ary pinnæ parallel in the middle, the upper border straight or sligh
concave, the lower curving in the last half to meet it at the more or l
upward turned tip of the pinnules which are obtuse, rounded, or som
what angular or even becoming obovate near the tip of the pinna, t
upper pinnules of the pinnæ attached to the rachis by a wider porti
of the base, becoming decurrent near the top, somewhat constricted
the base, the auricles diminishing or even disappearing in those ne
est the apex; rachial pinnules large, generally of the same form as t
middle ones of the secondary pinnæ but proportionately larger, the a
ricular appendages usually present and corresponding in proportion
terminal pinnules rhomboidal, narrow, spatulate, more or less obtuse
pointed, with one or two lobes in the lower part; nervation nephr
teroid, the secondary nerves springing from a number of rather larg
vascular bundles entering the base of the pinnule and dissolving in
distinct rounded nervils, diverging somewhat flabellately, equally cl
in all parts of the pinnule, dichotomizing from four to six times at a ve
narrow angle, arching gradually to the border, where they number 45-
to the centimeter; the upper surface of the more mature pinnules lo
gitudinally creased along the middle in the lower part over the thick
portion of the entering ribbon of nerves, the under side being cor
spondingly raised.

This singular species is, next to *N. Jenneyi*, the most abundant fern
the collection. Although the pinnæ are somewhat fragile or caducou
a few entire ones are present. The fern appears to have been lar
and bushy, the pinnation rather graceful and sometimes delica
From the asymmetrical character of some portions of the fronds, wi
secondary pinnæ on one side opposed to rachial pinnules on the othe
I am disposed to regard the fronds as dichotomous in the lower pa
like *N. heterophylla*, to which, through *N. Loshii*, it is closely relate
This view is strengthened by a distinct dichotomy seen in some of t
fragments of rachis found mingled with the pinnæ of this specie
These rachial fragments are a centimeter or more in width and are di
tinctly, rather coarsely, striated. The pinnæ are at right angles or o
lique, $1\frac{1}{2}$–3^{cm} apart, usually distant, but sometimes slightly overlappin
the secondary pinnæ being succeeded in the upper part of the prima
pinnæ by simple pinnules.

iles at the top of the primary pinnæ are long, 9^{mm}–3½^{cm} or
th, 2–20^{mm} or more in width, open or close, more or less
pering to a more or less slender acute or slightly obtuse
rger ones have the auricular appendages well developed
igher up become attached by the whole base, and finally
nilar in outline to the corresponding upper pinnules of
europteroides Newberry[1] (non Marrat, nec Grand'Eury, nec
he lower coal, Mill Creek, Ohio. In the latter the nerva-
general like that of *Odontopteris*. Some of the larger and
iles have a certain resemblance in outline to several of
of *N. Leberti*,[2] though in our species they are almost in-
e, with the auricles attenuated so as to suggest spines.
of Heer's species, judging by the figures, is but half as
r.

s of the secondary pinnæ have the base rounded above
tachment to the rachis, and, except near the tips of the
tenuate, auricled below like the mature large primary
described. The general outline is oblong, the borders
lower middle of the pinnule, often concave above, convex
unded in the distal half to meet in a somewhat angular
ounded apex, which is generally higher than the medial
wards the base of the pinnule, often occurring so high that
rgin is nearly straight. These pinnules, which show a
uniformity in proportions, are illustrated in Pl. IV., Fig. 9.
portions of the secondary pinnæ the auricular appendages
ened, as seen in the figures, the outline more oval or obo-
n Figs. 1 and 3, the attachment broader, and even de-
the nervation more odontopteroid, as in Newberry's *O.*
,[3] or in some specimens of the American *N. Loshii*. Fre-
air of pinnules at the base of the pinnæ are elongated, as
. 6, 8, and 9, that above being rather triangular, narrower,
e than the succeeding pinnules, while that below is lanceo-
, sometimes nearly three times as long as the next pin-
basal pinnules are comparable to the upper primary pin-
e caudal prolongation is not so fully developed. The
ules of the secondary fronds are spatulate or rhomboidal,
ceolate in some cases, rounded at the tip, generally united
o of the undeveloped pinnules preceding them, so as to ap-
ess sublobate, resembling those of *N. Loshii*, though gen-
ender. The terminal pinnules of the primary pinnæ are
se of the secondary pinnæ, though generally more acute
inctly sublobate. The pinnules below them of the lanceo-
IV, Fig. 5) may be quite distant or crowded together in

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[1] Geol. Surv. Ohio, Pal. I, 1873, p. 382, Pl. XLVII, Fig. 2.

[2] Fl. foss. Helv., Pl. II, Fig. 8, 10*b*.

[3] Op. cit., Pl. XLVII, p. 3.

much the same manner as in Lesquereux's *N. aspera*, at a
angle to the rachis, or oblique, straight, reflexed, or incurved.

The most striking characteristic of this species is the att
auricle at the lower side of the base of all the mature pinnules.
upper part of the pinnæ it first appears as a rounded lobe, g
elongating in the preceding pinnules until in the more mature
it reaches a length of 11^{mm} or more, generally terminating in
like point. This auricle may curve outward somewhat, pres
concave side to the rachis, rounding up to the attachment of
nule, or it may descend parallel and close to the rachis, or fr
it turns inward, crossing the rachis and passing underneath t
site pinnules. When the pinnules are contiguous or overlappi
usually the case, the lower part of the pinnule and its appe
covered by the preceding pinnule, as shown in Pl. IV, Fig. 8, i
case the point seldom appears unless its form shows through t
what coriaceous texture of the pinnules, or the pinna is disloc
the rachis splits, as frequently happens. A similar tendency
an elongation of the lower auricle is often seen in certain species
ropteris, especially in *N. Loshii.*[1]

The nervation of the species is nephropteroid. The midrib i
sented by a band of vascular bundles forking and diverging,
to the margin, in the manner illustrated by Lesquereux for *N*
in the Coal Flora. The secondary nerves, often obscure in th
thick texture of the pinnules, are round, close, forking five or six
seven times at a narrow angle, and are hardly larger at their ori
at the margin, equally close together in all parts of the pinn
measuring an average of about fifty-five per centimeter. The
bundles at the base of the leaf are slightly enlarged where t
from the rachis into the pinnule, but they soon dissolve into n
uniform size. The pinnules are slightly creased along the mid
distance over the thick vascular bundles in the axis, a similar
ary crease marking the position of the smaller band of nerves
to supply the auricle.

Relations.—In its general habit, pinnation, secondary, ba
rachial pinnules, and its nervation *Neuropteris caudata* rese
Loshii more than any other species. However, it differs from
from others, by its nervation, which is closer, there being no
midrib as in *N. heterophylla*, by its awn-like prolongation of t
auricle, and the linear acuminate forms of pinnule. *N. Lebe*
of whose pinnules resemble the larger primary pinnules of this
in form, is described as having its pinnules more distant, t
rib more distinct, and its secondary nerves fewer and forking a

---

[1] See Coal Flora, atlas, Pl. XI. See also *N. heterophylla* Brongn., in Zeiller, Fl. foss. Autu
pt. 1, p. 142, Pl. XII, Fig. 1.

These two species are considered as identical by Kidston and Zeiller. While this m
so far as the European specimens are concerned, it does not appear to be so with the Ame
referred to *N. Loshii*, which seem to have several characters not present in the European s

gle. From *Odontopteris neuropteroides* of Newberry the
of *Neuropteris caudata* differ by their closer nervation,
t of the auricle, and the constriction of the mature pin-
ase. The pinnules of the Ohio plant are decurrent,
l pair on the pinna.
Clelland's shaft; Hannam shaft.

NEUROPTERIS FLEXUOSA Sternb.

Pl. v, Figs. 1–5.

exuosa Sternberg, Versuch, i, 4, Tent., p. xvi, ii, 5, p. 71, Pl. xxxii,
847: Bunbury, Quart. Jour. Geol. Soc. London, iii, p. 425. 1849:
Quart. Jour. Geol. Soc. London, v, p. 141. 1858: Lesquereux,
., ii, p. 858. 1860: F. A. Roemer, Palæontgr., ix, p. 27, Pl. viii,
866: Lesquereux, Geol. Surv. Ill., ii, Palæont., p. 428. 1869:
Traité, i, p. 434, Pl. xxx, Figs. 12, 13. 1869: v. Roehl, Foss. Fl.
estphalens, p. 35, Pl. xii, Fig. 3a, Pl. xv, Fig. 10. 1870: Unger,
. Akad. Naturw. Wien, math.-nat. Cl., lx, p. 783, Pl. ii, Fig. 1.
son, Rept. Prog. Geol. Surv. Can. 1870–'71, p. 215. 1876: Ferd.
ethaea geognost., i, Pl. li, Figs. 5a, b, text (1880), p. 183. 1876:
antel, Verst. böhm. Ablag., iii, p. 64, Pl. xvi, Figs, 5, 6. 1880:
Steink. Ostseite d. Tödi, p. 5, Pl. i, Figs. 8, 9. 1881: Weiss, Aus
eink., p. 14, Pl. xv, Fig. 90. 1883: Schenk, in Richthofen's China,
(pars.). 1886: Kidston, Cat. Pal. Pl. Brit. Mus., p. 93. 1887:
adstock Ser., p. 359.
exuosa Sternb., Brongniart, Prodrome, p. 46. 1830: Brongniart,
39, Pl. lxv, Figs. 2, 3, 3a, b; Pl. lxviii, Figs. 2, 2a. 1879: Zeiller,
terr. houill., p. 51. 1883: Renault, Cours bot. foss., iii, p. 169,
Figs. 10, 11. 1886: Zeiller, Fl. foss. Valenciennes, atlas, Pl. xlvi,
; text (1888), p. 277.
xuosa Sternb., var. *α* Gutbier, Abdrücke, p. 56, Pl. vii, Figs. 1, 2, 5.

bi- or tripinnate, with large rachis, finely but distinctly
ary pinnæ caducous, at right angles to the rachis, or
e, linear, tapering, obtusely pointed; pinnules caducous,
or oblique, straight or curving slightly upwards, flat,
ous or overlapping, sometimes more distant, sessile,
ngle point, oblong, cordate at the base, the lower angle
or less extended, 8–25^{mm} long, 5–10^{mm} wide, the borders
nes contracted toward the base, rounded at the summit,
apex becoming shorter; terminal pinnule much larger
w it, ovate-lanceolate, generally cuneate toward the
often united with one or two rounded pinnules, the
undulate; median nerve distinct, dissolving about mid-
by a furrow up to two-thirds the length of the pinnule;
s numerous, very slender, originating at a very narrow
ng many times in fine, quite distinct veins.

f forms in the collection are specifically inseparable,
variations that are so nearly identical with certain
veral of the old-world species that it is alike difficult
all to any one of the European species or to find a
etween those types that should be placed in one group

belonging to one species and those in another group belonging t
species. This difficulty is complicated by the number of
species to which they are closely related, including *Neuropte*
phylla, *N. tenuifolia*, and *N. flexuosa*, to all of which different s
are perhaps referable, though each identification with one specie
involves specifically identical variations not described from
pean strata, but also involves a series of intermediate forms r
ing the steps in the transition to those types apparently re
another of the old established species. Were it not for the m
of the generally accepted old-world differentiation, by which
closely related and so commonly found together as some of
described under the above names, are retained distinct, th
stances would perhaps justify the separation of some of the
forms as a distinct species. Rather than increase the numb
cies having so much in common, I have followed Lesquereux,
them to the old species, though, as a whole, they illy fit the
descriptions, and at the same time I shall try to point out the
differences peculiar to the American plants.

Pinnæ and pinnules of the form represented by Brongn
others, with overlapping, rather oblong pinnules asymetricall
at the base, are found only among the rarer specimens. T
which is often remarkably flexuous, is generally distinctly
Usually the pinnules hardly touch, but stand about ½^{mm} apar
the distance in rare instances reaches 2^{mm}. Pl. LXV, Fig.
Histoire, closely represents the prevailing form among t
pinnules. The average length of these larger pinnules is abou
width 1^{cm}. All are more or less distinctly cordate at the
lower angle sometimes elongated. The specimens show ever
transition, from those in which the sides are nearly paralle
round, to those more or less wedge shaped, approaching the
ured by Lesquereux as *N. tenuifolia* in the Arkansas Rep
terminal pinnule is more or less sublobate or united to the
pinnules, as shown by Lesquereux in the Coal Flora, Pl. XI
by Gutbier, Abdrücke, Pl. VII, Figs. 1, 1a; and my Pl. V
2, 4. The number of the nerves at the margin of the pinnule
to fifty per centimeter. The specimens figured appear to be s
connected with typical specimens of *N. flexuosa* that I ha
them, not without doubt, under this species. Figs. 1 and 2
resent portions near the end of the primary pinnæ. In the o
of the terminal pinnules of the smaller secondary pinnæ they
any that I have seen figured under this name, but strongly
the *N. missouriensis* in the Coal Flora, Pl. VII, Figs. 5, 6, w
they may be identical, or some of those pinnæ figured by Zeil
Valenciennes flora, Pl. XLIV, as *N. heterophylla*. They are

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[1] Hist., Pl. LXVIII, Figs. 2, 2a.

[2] Vol. I, 1860, Pl. V, Fig. 2.

imen figured as *N. tenuifolia* by Lesquereux in
I, Fig. 5, and, being unable to separate the
n disposed to regard Figs. 1, 2, and 3 on the
nging to *N. flexuosa*, although so large a united
g. 1 would be remarkable in that species. Fig. 4
rdly belong to the same species, while the Cyclop-
), were subsequently[1] referred by Lesquereux

lateral margins, illustrated by Lesquereux and
Iissouri specimens, is, I believe, peculiar to the
es of this species.
of pinnæ of *N. flexuosa* in the collection are a
elongated rounded portions, including most of
een the nervils, have been removed, leaving only
ous covering on the stone, while the intact por-
ck. Corresponding to these thin portions in the
nlike troughs bordered and mingled with more
tter appear on the counterpart. At first I was
e appearances, so similar to the supposed *Neu-*
llustrated by Fontaine and I. C. White, Heer,
as indicating a fructification comparable, es-
sition, to that of *Scolopendrium*. The evidence
, especially in view of the altogether different
genus as described by Kidston and discovered,
y Lesquereux.
them Schimper, Heer, and Schenk, have com-
V. *tenuifolia*, while Kidston[2] regards *N. plicata*,
ux,[3] as belonging to *N. flexuosa*. My present
groups is tentative, especially so far as it con-
ype illustrated.
is flexuosa differs from *N. tenuifolia* by its pro-
nnules, more decidedly cordate at the base, its
ed and closer at the margin, and its terminal
r, larger, and more flexuous. The pinnules of
lly smaller, rather less densely nerved, the ter-
r and more elongated. *N. gigantea*, as described
ves finer and more crowded, the pinnules less
lly curved upward, the rachis often provided
pinnules, and the terminal pinnule smaller than
pecies differs from *N. vermicularis* by the thick-
ion of the terminal with the upper pinnules in
tata differs by its pinnules pedicellate, rounded,
uminate, the nerves flabellate.
l's shaft.

Surv. Ind., pt. 2, p. 52.
ants, p. 93; Trans. Roy. Soc. Edinb., xxxv, pt. 1, p. 314.
Figs. 1–4.

NEUROPTERIS TENUIFOLIA (Schloth.) Sternb.

1820. *Filicites tenuifolius* Schlotheim, Petrefactenkunde, p. 405, Pl. XXII, Fi
1826. *Neuropteris tenuifolia* (Schloth.) Sternberg, Versuch, I, 4, Tent., p. 5, 6, p. 72. 1846: Bunbury, Amer. Jour. Sci., 2d ser., p. 231. 1855 Verst. Steink. Sachsens, p. 22, Pl. XXVII, Fig. 3. 1857: Lesquereux, R Surv. Ky., III, p. 537. 1858: Lesquereux, Geol. Penn., II, p. Lesquereux, Geol. Surv. Ark., II, p. 312, Pl. V, Figs. 2–6. 1866: L Geol. Surv. Ill., II, Palæont., p. 428. 1869: Schimper, Traité, 1879: Lesquereux, Coal Flora, text (1880), I, p. 100; atlas, Pl. XII, 1884: Lesquereux, Am. Nat., XVIII, p. 922.
1830. *Nevropteris tenuifolia* (Schloth.) Sternb., Brongniart, Hist., p. 241, Fig. 3. 1886: Zeiller, Fl. foss. Valenciennes, atlas, Pl. XLVI, Figs text (1888), p. 273.

Fronds large, tripinnate; rachis striate; secondary pinnæ a or subopposite, often short, linear-lanceolate, tapering slow near the base to the obtusely pointed summit, at right angles or somewhat caducous, often touching or overlapping; pinnules much in size, alternate or subopposite, at right angles or straight or slightly curving upwards, usually contiguous or overlapping, but often distant, attached at a single point, s short pediceled, 5^{mm}–3^{cm} long, 1–7^{mm} wide, flat or slightly arc ward, more or less distinctly cordate at the base, oblong and with borders parallel or possibly laterally concave, or somew angular, the sides tapering to an obtuse apex; terminal pinnul than the lateral ones, lanceolate, sublobate, with somewhat shaped base, tapering to a round point at the top, the borde times undulate; midrib very distinct, quite strong at the base, two-thirds of the way up or more, marked by a furrow on th side of the pinnule; secondary nerves distinct though thin, ing at a narrow angle and forking two or three times into fine

To *Neuropteris tenuifolia* I have referred a series agreeing wi mens in the Museum collection identified by Lesquereux as be to that species. Some of the variations agree with the Euro scriptions and figures, and, although I have seen no foreign sp for comparison, the identification seems to be more satisfact in the case of the preceding species, and fewer forms are lef ently undescribed and unaccounted for. This species, like the pr is represented by fragments of fronds and pinnæ and detached p Forms identical in proportions and nervation with those fig Brongniart,[1] with tapering pinnæ, contiguous or slightly separa nules, the latter cordate at the base, and gradually contracting the tip, which is rounded, are the most frequent, while transitio lead to a few with the elongated pinnules having the margi nearly parallel, such as those figured by Lesquereux[2] or The forms with more triangular pinnules prevail generally, nules seldom overlapping, and often becoming rather broadly lar. In these phases it approaches the type figured by Les t.[1] The intermediate variations between the V. *flexuosa* and these forms are so many that it ially when the matrix is coarse and the nerva- decide to which species the specimen should

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[1] Hist., Pl. LXXII, Fig. 3.

[2] Coal Flora, Pl. XII, Fig. 6. Geol. Surv. Ark., Vol. II, 1860, Pl. V, Figs. 3, 4, 5,

[3] Fl. foss. houill. Valenciennes, Pl. XLVI, Figs. 1, 1*a*, 1*b*.

he American specimens referred to *N. flexuosa* not only far from being completely identical ies in all their forms, but these variations very ific unity of the American specimens in a single ing *N. missouriensis*, and perhaps distinct from oining characters differentiated in and common l forms. The same difficulty in differentiating em in complete accord with either or both of the nentioned by Bunbury in his descriptions of the n,[2] and by Lesquereux in the Coal Flora.[3] Al- atisfactory dividing line separating our speci- I have followed my distinguished predecessor in f my ability, though undoubtedly with errors, he old-world species to which they appear to ely. While many of my specimens agree per- the U. S. National Museum collections, identi- *N. tenuifolia*, I am inclined to regard some of nder that name as standing nearer the forms though others[5] seem to represent the former. Pl. XII, of the Coal Flora with the triangular either of these species seems to me very doubt- s shown in the species approach *N. gigantea*, as Brongniart, and Weiss, in habit, form, and dis- he terminal pinnules are larger, the nervation d the small rachial pinnules observed by Stern- nting in our specimens.

nctions between *N. tenuifolia* and *N. gigantea* ed. The former is said to differ from *N. flexuosa* more tapering, narrower in proportion to the on less crowded, while the pinnules are propor- secondary nerves finer and less crowded than .

d's shaft; Hannam's shaft.

IS cf. TRICHOMANOIDES (Brongn.) Lx.

Pl. IV, Fig. 10.

omanoides I have compared three specimens of erved portions agree well with Brongniart's orig-

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Fig. 2.

Soc., London, III, 1847, p. 425.

Figs. 1, 2, 3, 5.

Report Geol. Surv. Ark., Vol. II, 1860. pl. v., Figs. 3–6.

inal description and illustration[1] as well as with those of several
European authors.[2] While the Missouri fragments have the th
ture, the outline orbicular or oval, and the nerves rather thin, di
distant in the lower part, dichotomizing several times, to about ei
to the centimeter at the border, I still hesitate to refer them de
to that species, for the reason that in none of them are the bas
and attachment shown. The specimen figured is possibly only
representative belonging to the same plants as those describe
as *N. dilatata* (L. and H.) Lx., the specimens of both being foun
gled with the remains of *N. flexuosa* and *N. tenuifolia*. The
markedly from the specimen figured by Lesquereux in the Coal
as well as with the specimens from Cannelton, Pennsylvania, id
by him as *N. trichomanoides* in the Museum collection, in wh
nerves are much closer in all parts, numbering forty-eight to f
per centimeter at the border.[4] The latter are much finer vein
anything elsewhere described under that name. Von Roehl[5] an
ton[6] having found *Cyclopteris* pinnules, which they accept as *C.*
manoides, attached to *Neuropteris heterophylla* (*N. Loshii* in part),
them as the rachial pinnules of true *Neuropteris*, but Grand 'Eu
Zeiller[8] prefer to consider the pinnules identified by themselve
trichomanoides to be odontopteroid on account of their associati
Odontopteris minor and *O. Reichiana*. I have placed these and
following *Cyclopteroid* pinnules in the genus *Neuropteris*, because
all the specimens and blocks broken up in the collection, com
fourteen boxes of material, I have not yet seen a fragment of any
of *Odontopteris*.

Locality.—McClelland's shaft.

NEUROPTERIS DILATATA (L. & H.) LX.

1833. *Cyclopteris dilatata* Lindley and Hutton [non (L. & H.) Sternb.], Fos
II, Pl. XCIB.

1849. *Nephropteris dilatata* (L. & H.) Brongniart, Tableau, p. 16 (65). 1869: S
Traité, I, p. 430.

1880. *Neuropteris dilatata* (L. & H.) Lesquereux, Coal Flora, I, p. 78.

Pinnules very large, transversely oblong or oval-orbicular, as
rical, very deeply auriculate, the lobes often overlapping, the
sinus subcentral; margin more or less undulate; texture rathe
nerves of moderate size, quite distinct, though often dissocia
spread out, radiating flabellate from the base, about 6–10 to

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[1] Hist. Vég. foss., I, (1830), p. 217, Pl. LXI bis, Fig. 4.

[2] Geinitz, Verst. Steink. Sachsens, 1855, p. 23, Pl. XXVIII, Figs. 2, 3. Heer, Fl. foss. Hel
17, Pl. VI, Fig. 16. Breton, Étude géol. Dourges, 1873, p. 61, Pl. VI, Fig. 3 (not 1, 2). Ren
bot. foss., III, 1883, p. 184, Pl. XXX, Fig. 5.

[3] Pl. IV, Fig. 4, p. 79.

[4] Mr. Lacoe informs me that these Cannelton specimens were afterwards removed from
manoides by Lesquereux, whose unfinished MS. contains the note that it belongs to a n
although it was not named.

[5] Foss. Fl. Steink. Westphalens, 1869, Pl. XVII.

[6] Cat. Pal. Pl. Brit. Mus., 1886, p. 90.

[7] Fl. Carb. Loire. 1877, p. 113.

[8] Fl. foss. houill. Commentry, I, 1888, p. 266.

e-third of the distance to the border, dichotomizing 5-7 sing, slightly arcuate, to the margin, where they number r more per centimeter.

ariation in the form and peripheral characters, as well as as been observed among the pinnules of the same species , even when attached to the same rachis, has cast much prevailing discrimination of the forms in species. Pin- ng to the same species may be more or less cuneate, or ve overlapping auricles. Size is of but little specific ever, while it may well be that the pinnules of the same *pteris* or *Odontopteris* have been described under different not seem quite probable that *Cyclopteris dilatata*, *C. orbic- ata*, and *C. trichomanoides* all are parts of *Neuropteris* The large number of species of *Neuropteris*, a portion of own to have borne cyclopterid pinnules, and of *Odontop- achial* pinnules are sometimes cyclopterid, furnishes in eason for the attempt to distinguish specific characters any cyclopterid forms. It appears probable that the of those whose actual pinnate relations are not definitely ltimately be based chiefly on the characters of nervation The only illustration of *Neuropteris dilatata* L. & H. of ware is that given in the Fossil Flora. Of the original Kidston, in his valuable Notes on the Palæozoic Species the Fossil Flora, says,[1] "The nervation is not sufficiently etermine the species. I believe, however, that it is refer- *pteris heterophylla*, Brongn." The enumeration and brief this species made subsequently by Goeppert, Unger, and m to have been based wholly upon Lindley and Hutton's rief characterization. It appears, therefore, somewhat ther the American species is identical with that repre- e British specimen. I have, however, thought best to e present, the name employed by Prof. Lesquereux for pinnule. The identification of my specimens with those Lesquereux under that name, is based upon a comparison cimens originally described in the Coal Flora, p. 78, hands through the courtesy of Dr. J. H. Britts of Clin- , of whose collection they form a part. The pinnules, must have been as much as 25^{cm} in longer diameter, are k texture, and irregularly sinuate at the margin. Some nts show evidence of a more or less longitudinally oval to that seen in *C. orbicularis*, with which Zeiller[2] unites *latata* L. & H. The nerves, as described above, are gen- t, sometimes appearing narrow and rounded, but usually ad out, similar to the nervation shown by Goeppert[3] in

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[1] Proc. Roy. Phys. Soc. Edinb., vol. x, 1890–91, p. 366.

[2] Fl. foss. houill. Valenciennes, p. 298.

[3] Gättungen, Lief. 5 u. 6, p. 91, Pl. IV u. V, Fig. 2.

Cyclopteris crassinervis, which is perhaps referable to our sp
they are separated into two close parallel bundles. Occasiona
are dissociated into filaments. It is hoped that these original A
forms may eventually be illustrated.

Relations.—The relations of *Neuropteris dilatata* to other Cy
species is undefined. The American specimens appear to confo
closely to the description and characters of *N. trichomanoi*
which they differ perhaps by their rather thicker texture and
nerves. The size, which was formerly one of the distinguisl
tures of *N. dilatata*, is not much greater than that of the *N. t*
noides figured by Zeiller in the Commentry Flora,[1] the general c
of which, excepting the very thin nerves, more distant at the m
very much like that of our specimens. As stated above, it
possible that the specimen, Pl. IV, Fig. 10, compared to *N. t*
noides, is really a small specimen of this species. *N. dilatata*
differ from *Cyclopteris orbicularis* by its nervation, proportional
at the base, branching more irregularly and at a narrower an
less dense at the margin.

Locality.—McClelland's shaft; Hannam's shaft.

NEUROPTERIS, SPECIES.

Pl. V, Fig. 6.

Two other forms of cyclopterid pinnules occur in the co
whose specific characters seem hardly sufficient to warrant eitl
reference to any of the well-defined species or the foundation
one. The first, Pl. V, Fig. 6, is a large fragment representing the
part of the right half of an oval-orbicular pinnule, somewhat
apparently without a distinct auricle, with a sinuate margin
rather closer than in the last species, forking five or six times, g
at a rather wider angle than in the former, and arching conside
the margins. A conspicuous feature is the nearly uniform dic
ing of the nerves at about 8^{mm} from the margin, forming a well
marginal zone, in which the nervation is almost twice as clos
to thirty-six per centimeter, as it is just central of the line of
omy. In nearly all respects the specimen agrees well with
figured by von Roehl[2] as *Cyclopteris orbicularis.*

Another pinnule is subsemicircular below, its top round-t
3¾^{cm} wide, 16^{mm} long, with thin nerves, sometimes dilated at t
radiating from the long basilar attachment, and forking thre
times in passing to the border, where they number about th
per centimeter. While its specific relations are unknown, the
fication of the same form in other localities can not be witho
homotaxial value. I have not therefore attempted to place i

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[1] Pt. I, Pl. XXIII, Fig. 3.

[2] Foss. Fl. Steink. Westphalens, p. 43, Pl. XXI, Fig. 3.

is slightly suggestive of the rachial pinnules of *Odontop* x.,[1] the *Cyclopteris semiflabelliformis* of Morris,[2] and *C. densa* ill.[3] It is probably a *Nevropteris* pinnule, there being no *Odontopteris* in the collection.
-McClelland's shaft.

DICTYOPTERIS Gutbier. 1835.

DICTYOPTERIS SQUARROSA Ett. sp.

is squarrosa Ettingshausen, Abhandl. K.-k. geol. Reichsanst., i, 3, No. , Pl. vi, Fig. 3.
ris neuropteroides Gutb. in litt., Geinitz, Verst. Steink. Sachsens, p. 23, v, Fig. 6, 6a. 1864: R. Andree, N. Jahrb. f. Min., p. 170. 1866: Bureau, oc. géol. France, [2] xxiii, p. 848, Pl. xiv, Figs. 3, 4. 1868: Weiss, naturh. Ver. pr. Rheinl. u. Westphal., xxv, p. 83. 1869: Karl Feist-, Steink. Klein-Přilep, etc., pp. 34, 61, 94. 1869: v. Roehl, Foss. Fl. Westphalens, p. 49, Pl. xvi, Fig. 6. 1869: Schimper, Traité, i, p. 873: O. Feistmantel, Zeitschr. d. deutsch. geol. Gesell., xxv, p. 598. O. Feistmantel, Jahrb. K.-k. geol. Reichsanst., xxiii, p. 277 (29). . Feistmantel, Abh. k. böhm. Gesell. Wiss., [6] vi, p. 81. 1874: tmantel, Abh. k. böhm. Gesell. Wiss. [6], vii, p. 24. 1874: Areitio, Soc. esp. Hist. nat., iii, p. 250. 1876: Heer, Fl. foss. Helv., p. 36, Pl. g. 9. 1877: Grand 'Eury, Fl. Carb. Loire, p. 120. 1881: Weiss, Aus Steink., Pl. xv, Figs. 93, 93a. 1882: Schütze, Abh. geol. Specialk. en, iii, 4, pp. 77, 226. 1883: Karl Feistmantel, Mittelböhm. Steinkohlag., p. 61. 1883: Kušta, Sitzb. math.-nat. Cl. k. böhm. Gesell. Wiss., , 172, 178. 1884: Lesquereux, Coal Flora, iii, p. 833.

innate, pinnæ opposite or subopposite; pinnules opposite te, at right angles to the rachis, sessile, close, contiguous overlapping, entire, $2–3\frac{1}{2}^{\mathrm{cm}}$ long and $9–12^{\mathrm{mm}}$ in width, the oval, those of average length, or longer, somewhat falcate, ate or truncate-cordate, often unequal at the base, oblong-apering towards the end, obtuse; terminal pinnules long, r-lanceolate, obtusely pointed; median nerve dissolved slender secondary nerves, at first close and nearly parallel, adually and forking four or five times, and anastomosing ery obliquely to the border; secondary nerves near the te from the point of attachment; meshes very narrow, h end, greatly elongated near the median line, becoming its borders.

rominent characters of this species of *Dictyopteris*, frag-ch are scattered all through the shales sent from Aurora, r narrow pinnules, sometimes slightly dilated at the base, ariculate, the larger ones falcate towards the tip, which is ather weak median nerve dissolving at about one-third or distance up the pinnule into fine, nearly parallel secondary ing gradually towards the margin, which they meet quite d the areolation, elongated and narrow proportionately,

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Coal Flora, i, p. 131, Pl. xxi, Fig. 1.

[2] Trans. Geol. Soc. London [2], v, 1840, p. 448, Pl. xxxviii, Fig. 7.

[3] Fl. foss. houill. Commentry, pt. 1, p. 267, Pl. xxiii, Fig. 4.

even at the margin. The slender secondary nerves hardly anas
until they have passed some distance from the median line, the
becoming shorter, but continuing narrow nearer the margi
areolæ are bounded by irregularly curved nervils and are acut
ends. The general characters of the pinnules are fairly well sh
Ettingshausen[1] in his original figure of *Neuropteris squarrosa*, a
the tips of the pinnules are broken, only indicating the falcate
curve towards the end. This is better shown by von Roehl[2], p
of whose specimen are proportionately considerably wider at th
the lateral borders converging more rapidly. The figure of *Dict*
neuropteroides given by Geinitz,[3] and copied by several autho
cates a rather more pronounced curvature in the middle of the p
and an apex rather more acute than that seen either in Ettingsh
figure or my specimens. The pedicel seen in Dr. Geinitz's figur
somewhat doubtful. The shorter and broader pinnules of this
are oval and truncate-rounded at the base, similar to the pinn
the main rachis of Gutbier's *Dictyopteris Brongniartii*.[4]

In 1855 Dr. Geinitz, when describing the *Dictyopteris neurop*
Gutb. in litt., inscribed the name *Neuropteris squarrosa* Ett.
synonymy only with doubt, having only Ettingshausen's figure
him. Their identity was verified, however, by R. Andree[5] in th
ination of a collection of fossil plants from the same source a
studied by Ettingshausen, viz, Stradonitz, and his verification h
accepted, I believe, by all European paleontologists except
who referred[6] *Neuropteris squarrosa* to *Neuropteris cordata* L
apparently on account of the original figure and Ettingshausen
parison of it with *N. macrophylla*.

Among the fossil plants in the collection of the U. S. Natio
seum are two specimens (No. 1463) from Stradonitz, Bohemia,
Neuropteris squarrosa Ett., apparently in Ettingshausen's ow
writing. These specimens comprise several pinnules whose ag
with my specimens, as well as with the original figures, is clearly
cal. In all the characters of form, size, texture, and nervat
American and the Bohemian species agree.[7] Certainly the *Neu*
squarrosa is a *Dictyopteris*. I can find no reason for disagreei
the European authors in uniting it with *Dictyopteris neuropt*
But, such being the case, it appears that conformity with the
nomenclature demands that Ettingshausen's specific name, pu
described, and illustrated in 1852, should have priority over G
name *Dictyopteris neuropteroides*, first published by Geinitz in
"1850 v. Gutbier in litt." Gutbier's manuscript name of 1850

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[1] Steinkohlenfl. Stradonitz, Pl. VI, Fig. 3.

[2] Foss. Pfl. Steink. Westphalens, Pl. XIV, Fig. 6.

[3] Verst. Steink. Sachsens, Pl. XXVIII, Figs. 6, 6a.

[4] Abdrücke, Pl. XI, Fig. 7.

[5] Die Versteinerungen d. Steinkohlenformation v. Stradonitz in Böhmen, N. Jahrb. f. Min.,

[6] Cat. Pal. Pl. Brit. Mus., p. 98.

[7] It is hoped that examples of these pinnules may be hereafter illustrated.

vhen, before its publication, the species had been fully d figured under another designation. I have, therefore, ttingshausen's species, both as identical with the American o, granting it to be identical with *Dictyopteris neuropter-* ing priority over the other name.

–This species is most nearly related to *Dictyopteris Brongni-* hich it differs by its insignificant median nerve and its rves, which are much finer and clearer, forming larger and shes. The areolæ of *Dictyopteris Brongniartii* are very near the middle of the pinnæ, without so much variation between the meshes near the median line and those near The form of the pinnules, including the short oval ones of *oides*, is largely similar to that of the *Dictyopteris Brong-* sented by Gutbier.

is Schützei has a strong midrib, the secondary nerves arch- rder, and its areoles much smaller. *Dictyopteris Scheuch-* ate-acute pinnules, with distinct midrib and nerves arch- forming very fine, irregular meshes, while *Dictyopteris* rather pronounced midrib, the nerves curving to the bor- areolation nearly alike in all parts of the pinnule, some- nal and often hexagonal.

-Aurora; also at Hannams' shaft.

ANOMALOUS FORMS.

APHLEBIA Presl. 1838.

nature of these interesting remains, which have been t different times in the genera *Fucoides*, by Gutbier, Presl, *Schizopteris*, by Brongniart, *Hymenophyllites*, by *achyphyllum*, by Lesquereux, *Rhacophyllum*, by Schimper, Germer, and in *Palmacites*, *Algacites*, *Rhodea*, *Trichoman-* *minarites*, by various authors, is not yet perfectly clear. nsidered by various botanists as primordial fern fronds, stipal fronds, or anomalous laciniate pinnules sometimes the base of the primary pinnæ. They were considered eux as including types related to several ranks of vege- having affinities with *Neuropteris*, *Hymenophyllum*, and others as being parasitic on fern stems, or as derived from rimary rhizomatic tufts of leaves, while others might be

very in recent years of *Aphlebiæ* attached to the rachis of es of *Pecopteris* and *Sphenopteris*, such as *P. dentata*, *P.* *breviata*, and *Sphenopteris crenata* strengthens the view now ntertained, that most of the species of *Aphlebia* are stipal nnæ growing from the bases of primary or secondary nilar to the foliar growth seen in *Hemitelia capensis* Br., or

Gleichenia gigantea Wall. However, Kidston's claim to having fou both sterile and fruiting fronds of *Alicornopteris convoluta*,[1] a frond a parently closely related to some forms of *Aphlebia*, indicates that t above hypothesis may account for only a portion of the species. It not improbable that more than one group may be represented amo these anomalous remains. Zeiller points out with justice, when resto ing Presl's genus, that the type to which Brongniart applied the na *Schizopteris* does not belong to the genus *Aphlebia* or *Rhacophyll* and that *Aphlebia* has priority and should be retained in spite of i derivative signification, the name of a genus or species being in effe a designation rather than a description. A similar misnomer is famili as *Calamites*.

APHLEBIA ARBORESCENS Lx. sp.

1870. ***Hymenophyllites arborescens*** Lesquereux, Geol. Surv. Ill., vol. IV, p. 415, XVII.

1874. ***Rachophyllum arborescens*** (Lx.) Schimper, Traité, III, p. 525. 1880: Lesquere Coal Flora, I, p. 314.

Primary pinnæ large, linear, acute (?) sympodially dichotomous, t axis straight or slightly flexuous; secondary pinnæ alternate, obliq rather strong, decurrent, curving outward, not constricted at the ba divided into alternate oblique, more or less regularly and deeply lob segments; lobes or pinnules, alternate simple, linear-lanceolate, or or trifid, the ultimate divisions shorter and more broadly lanceola nervation usually very obscure, the main axis flat, marked by obscu vascular bundles, giving off other thin bundles which pass, mingl with cellular tissue, into the secondary divisions.

This fine form of *Aphlebia* is well illustrated in the Illinois rep referred to above. The most prominent features of the species are t long frond with its axis rather broad and flat; the obscure nervati in the cellular tissue; the branches or secondary pinnæ, moderat broad, ramose, the borders close or slightly overlapping; the divisio deeply dissected into broadly diverging lobes; and the lobes broad lanceolate, of varying length, and generally acute.

Aphlebia arborescens is very similar to some of the forms referred *A. filiciformis* Gutb. The one figured in Gutbier's Abdrücke, Pl. Fig. 13, is very similar to some of the upper secondary pinnæ in m specimen, though the former are rather less distinctly dissected. does not seem probable that the large number of forms included Geinitz, Kidston, and some other authors under *A. filiciformis* are representations of a single species. In view of the fact that a lar number of species of ferns belonging to several genera have been di covered to bear *Aphlebia* pinnæ, it becomes probable that the numb of species of the latter genus must be considerable, and that in *Aphl bia*, as well as in *Cyclopteris*, a more careful and critical examinati and differentiation of the forms will better serve the interests of bot geology and biology.

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[1] Trans. Roy. Soc. Edinb., vol. XXXIII, 1889, p. 152, Pl. VIII, Figs. 11-15.

–Among the described species of this genus *Aphlebia arbo-* st nearly related to *A. filiciformis* and *A. elongata* Zeill. rmer it differs by its broad, flat, rather thin axis and th the vascular tissue obscure or invisible, and the well- ltimate divisions broader, often longer, and more acute. tion is also more robust. *Aphlebia elongata*, as described , on the contrary, more ovate-lanceolate in the contour, livisions preserving the same form, the division very much , and deeply dissected, the lobes much closer, more fascicu- rance and elongated, the sinuses being narrow and acute. try species differs further by the presence of a large median

McClelland's shaft.

LYCOPODINEÆ.

SIGILLARIÆ.

SIGILLARIA Brongn., 1822.

exception of some macrospores which may perhaps belong ne Carboniferous lycopods, but which are not so preserved identifiable, the only remains of this great order that I ed in the entire collection consist of numerous fragments of which belong probably to the genus *Sigillaria*. These road and rather thin, but seldom flattened, the circum- reservation having been such as to keep them in nearly l form. Some of the fragments are 20^{cm} or more in length, in width, quite rigid, and tapering very gradually. From the decrease in width is hardly perceptible in specimens ng it is probable that the larger ones may have attained $0–50^{cm}$ or more. The surface is covered with a thin, black, , coaly covering in most of the specimens. The upper sur- cterized by a strongly marked, rather broad furrow $2–2\frac{1}{2}^{mm}$ es of which curve slightly downward to a rounded angle or to a quite distinct fine rounded medial crease in most here the coaly covering is removed. Under the lens the e groove is rather distantly striated. Bordering the groove ler raised lines, one on each side, apparent on most of the These may be nerve bundles or ducts originating in the rices of the scar. From these lines to the margin the sur- eaves is nearly flat or slightly curved upward, the only in- eing a fine line in slight relief from the parenchyma at a bout $\frac{1}{2}–\frac{2}{3}^{mm}$ from and parallel to the border. The lower e leaves is marked by a carene about 2^{mm} wide, the edge unded, though not raised very high. On either side of the vell-defined crease, probably the stomatiferous crease de-

scribed by Renault. A faint secondary crease is seen in some sp
situated just within the line near the border noted in the descri
the upper surface. The latter, which is also quite distinct in
men belonging to the same species in the museum collection fro
physboro, Illinois, would seem to indicate the presence of a
nerves near the border. Such a condition would, however, be c
to the conclusions reached by Renault from his researches in
ternal structure of the lycopodiaceous leaves of the Coal Meas
well as to the results of Kidston's examination of the group repr
by *Cyperites bicarinata* L. & H.,[1] which he regards[2] as uninerv
belonging to *Sigillaria* or *Lepidodendron*. Enough is not yet k
described of the leaves of this group to make them of much ass
in the identification of species; and considering the known vari
proportions of the leaves in the different parts of the same tree
probable that great assistance can be expected from a special s
them. However, comparatively few have ever been illustrate
scribed. Of these, one of the specimens figured by Ettingshau
Flabellaria Sternbergii, subsequently refigured by O. Feistma
belonging probably to *Lepidophyllum*,[4] is much like our specimen
general aspect of the leaves is much that of the one figured and
to *Lepidodendron* by Lesquereux[5] or the *Lomatophloios macrole*
illustrated by Renault in the Atlas to the Commentry flora[6].

Several specimens from the Preston colliery, in Schuylkill
Pennsylvania, and from Murphysboro, Illinois, containing lea
tween which and my specimens I can see no difference, are
fossil-plant collection of the U. S. National Museum, but I h
satisfactory information as to their floral association on which
more than a supposition as to the identified trunks to which th
have belonged.

Locality.—Abundant at McClelland's shaft; rare in the shal
Carterville.

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[1] Fossil Flora, I, Pl. XLIII, Figs. 1, 2.

[2] Proc. Roy. Phys. Soc. Edinb., X, 1890–'91, p. 359.

[3] Steinkohlenfl. Radnitz, Pl. XXIV, Fig. 2.

[4] Verst. böhm. Ablag., II, Pl. XX, Fig. 3, p. 43 (217).

[5] Geol. Surv. Ill., II, Palæont., p. 455, Pl. XLV, Fig. 6.

[6] Pl. LVIII, Fig. 1.

. PHANEROGAMS.

YMNOSPERMÆ.

CORDAITEÆ.

ORDAITES, Unger. 1850.

ORDAITES COMMUNIS Lx.

esquereux, Proc. Am. Phil. Soc., XVII, p. 320. 1880: Les-
ra, I, p. 534. 1880: Fontaine and I. C. White, Permian
: G. Hambach, Bull. Geol. Surv. Mo., I, p. 85.

oblique at the stem, somewhat imbricated, vary-
reaching a length of 25^{cm} or more and a breadth
apidly narrowed to the base, the borders gen-
l; primary nerves, twenty-four to twenty-six per
pecially on the under surface of the leaf, rela-
; intermediate nerves, two to four, rather indis-
ently minutely shagreened.

any difference between the abundant fragments
he shales of McClelland's shaft and specimens of
om Clinton, the locality whence came the types
ux in the Coal Flora. I have not seen the leaves
nor examples of the peculiar fructification men-
The density of the nervation remains constant,
nty-two to twenty-four primary nerves per centi-
rtion of the blade, thus apparently constituting
r the species in this region, although but little
been given by paleontologists to the density of
leaves in determining the species of *Cordaites*.
lso represented by specimens from Van Buren,
onal Museum collection.

s communis appears to be closely related to *C.*
Ung., from which it was distinguished by Les-
leaves, more rapidly narrowed to the base. Its
e less dense. Small fragments of the leaves are
ge of *C. principalis* (Germ.) Goepp., as figured by
ne leaves of *C. principalis* as generally described are
e primary nerves usually farther apart. The dis-
of the American species and those of the old world
until foreign specimens are in hand for compari-
ic purposes it will suffice to be content for the
ng the new material so far as possible with the
entified by Lesquereux, Newberry, and Andrews.

., Pl. I, Figs. 12–16.
rdwestl. Sachsen, p. 32, Pl. IV (XXIV), Figs. 1, 2.

Fragments of the leaves of *C. serpens* Lesq. are also similar t
cies, but the primary nerves of the former are farther apart,
of the secondary or intermediate nerves is stronger than the

Locality.—McClelland's shaft; Aurora.

CORDAITES cf. COSTATUS Lx.

A few fragments of leaves are present which agree fairly
the corresponding portions of Museum specimens of *C. co*
scribed and illustrated by Lesquereux.[1] The leaves are nar
sionally appearing somewhat palmately divided. The prima
eighteen to twenty per centimeter, are sharp, with four thin int
nerves. While my fragments appear to belong to the same
the specimens in the Museum collection, I hesitate, in the a
the characteristic stems with narrow carinate interrupted ridg
ring from the attachments of the leaves, to refer them definite
species.

Locality.—McClelland's shaft.

CORDAIANTHUS Grand 'Eury. 1877.

CORDAIANTHUS, species.

Ten specimens of the fruiting spikes of *Cordaites*, all belong
ably to the same species, are found in the material from
These are included in Grand 'Eury's division, *baccifer*, havi
in the axils of foliaceous bracts along the raceme. The con
preservation is not such as to allow a satisfactory specific iden
or description. The spikes are long and slender, one of the s
both ends of which are broken away, still measuring 18^{cm}
In width they are $12–15^{mm}$. The axis, $2–3^{mm}$ in diameter, i
slightly striate and somewhat zigzag, corresponding to th
ments of the ovules, and concave in the intervals, similar to
of the axis in "heads" of wheat or rye. The fruit capsules a
close, oblique to the axis, and arranged spirally. The bracts
slightly exceeding the ovule in the younger state, and appare
ing away when the fruit is more mature. The ovules are ovat
about 5^{mm} or 6^{mm} in length, and 3^{mm} or 4^{mm} in width, and
striated. In form they resemble the *Cordaianthus subger*
figured by Grand 'Eury[2] or the *Antholithus* illustrated by N
from Youngstown, Ohio, but in size and arrangement they n
have been nearer Grand 'Eury's Fig. 11, of *Cordaianthus*, on Pl
the Loire flora. When broken longitudinally the appearanc
like the spikes seen in the *Cordaicladus selenoides*, Fig. 1, Pl. x
latter work. Although I have not yet seen any specimens n

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[1] See Proc. Am. Phil. Soc., XVII, 1878, p. 323, Pl. LI, Figs. 1–3, and XVIII, 1879, p. 222, Pl.
Coal Flora, vol. II, p. 540, Pl. LXXX, Figs. 1–3, Pl. LXXXVI, Figs. 1, 2.

[2] Fl. Carb. Loire, p. 232, Pl. XXVI, Fig. 10.

[3] Annals of Science, II, Cleveland, 1854, No. 1, p. 3, Fig. 2; Geol. Surv. Ohio, vol. I, pt
p. 363, Pl. XLI, Fig. 2.

ing with these very long, slender spikes with crowded
t bracts, the latter often apparently absent, I have
ot to describe them under a new name until seen in
material or compared with other collections.
Clelland's shaft.

CORDAICARPUS Geinitz. 1862.

CORDAICARPUS LINEATUS Lx.

lineatus Lesquereux, Coal Flora, III, p. 805, Pl. CXI, Fig. 16.

actly cordate, about $8\frac{1}{2}^{mm}$ long and $6\frac{1}{2}^{mm}$ wide in the
, 4^{mm} thick, finely striated, the apex slightly elongated
or mucronate point, the edges rounded, the sides some-
e basal sinus distinct, marking the sides for a short
lower portion by a shallow vanishing groove; sarco-
he same form as the endotesta, except at the apices of
e it is somewhat dilated or enlarged downward, about
edges of the endotesta at the middle, and 3^{mm} or $3\frac{1}{2}^{mm}$
e of the lobes, the medial sinus reaching nearly or quite
e endotesta, which appears to be provided with a short
into the chalaza.

veral fruits are found, mingled with fragments of the
es, in a specimen of dark laminated sandy shale from near
re delicate vegetable tissue is carbonized. The fruits are
rasite. The best preserved fruit on the block represents
ndotesta, in marcasite, of a *Cardiocarpus* with its semi-
ope or sarcotesta. The former is exactly cordate, acute
the apex with the surface longitudinally striate. The
coverings of the nucleus is not clear.

specimen is somewhat smaller than the figure of *Cor-*
us Lx., given in the Coal Flora,[1] the nucleus or endo-
ne form and character as in that species whose descrip-
entirely on the nucleus, and it is most probably identi-
hether or not *C. lineatus* is a good species.

the nucleus itself is somewhat like *Cardiocarpus pachy-*
strated in Fig. 15, Pl. CIX of the Coal Flora, though
the upper part; or like *C. zonulatus* Lx., Pl. CX, Figs.

a lateral view in the endotesta is suggestive of several
uch as the *Cordaicarpus major*, *C. ovatus*, and *C. con-*
y Grand 'Eury,[2] Newberry's *Cardiocarpon latum*,[3] *Car-*
tum Daws,[4] *Cardiocarpus Ottonis* Gutb.,[5] *C. Gutbieri*

16, p. 805.
XVI, Figs. 16, 20, 21.
Cleveland, 1853, No. 13, p. 153, Fig. 3; Geol. Surv. Ohio, I, Pt. 2, Paleont., p. 372, Pl.

pp. Sil. Can., 1871, p. 60, Pl. XIX. Fig. 214.
n, 1849, p. 27, Pl. IX, Fig. 7.

Gein.,[1] *Cordaicarpus acuminatus* R. and Z.,[2] and *C. sclerotesta* Br It is most similar, however, to *Cardiocarpum australe* Carr.,[4] a *C. emarginatum* Brongn. figured by O. Feistmantel from th Measures of Bohemia.[5]

The relative proportions of the envelope are somewhat like thos in *Cardiocarpon ingens* Lx.,[6] or the *C. latum* of Newberry, excep the sarcotesta of our species is thinner near the apex, where it parently traversed for some distance at least by the elongated a the endotesta, while its lower portion is emarginate at the base *C. ingens*, in Newberry's *C. samaræforme*[7] or Dawson's *C. cornutu* the *C. emarginatum* above referred to. The thickening of the en in the lobes is comparable to that seen in *C. Baileyi* Daws.,[8] *C. B* Lx.,[9] or the *C. sclerotesta minor* figured by Brongniart in his ful work on the Silicified Fruits.[10]

Cordaites is now one of the best known of the Paleozoic pla trunk, including the pith *Artisia* and *Sternbergia*, having been nized and studied histologically as *Dadoxylon* Endl. (*Arau* Goepp.) and *Cordaioxylon* Gr. 'E., the branches as *Cordaicladus* the leaves as *Cordaites* (*Pycnophyllum* Brongn.), *Dory-Cordai* 'E., *Poa-Cordaites* Gr.'E., *Dictyo-Cordaites* Dn., and *Scuto-Corda* and Z., the inflorescences as *Cordaianthus* (*Antholithus* L. & *Cordaistrobus* Lesq., and the fruits *Cordaicarpus* Gr. 'E. (*Cyclo* and *Jordania* Goepp. and Fiedler), and *Cordaispermum* Gr. 'E. type most authors now refer the whole or the greater part genus *Cardiocarpon* Brongn. The argument for the relations *Cardiocarpon* to the *Cycadaceæ* was forcibly presented by Dr. Ne in his Report on the Fossil Plants in the Paleontology of Ohio.[1 combined researches of several authors have made known the ture of both the male and female flowers of *Cordaites*, the poll fertilization of the ovules, and the developmental stages of the *carpus* (or *Cardiocarpon*), specimens of which have been found tached to stems with leaves.

Relations.—*Cordaicarpus lineatus* Lx. most closely resembles *minatus* R. and Z., *C. australe* Carr. sp., and probably *C. emar* Brongn. It is possible that it may belong to the first of these speci faint striation being only the result of abrasion or erosion of the li endotest. The latter is described as having the lateral borders st

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[1] Geinitz: Verst. Steink. Sachsens, Pl. XXI, Fig. 23 (not 24, 25); Von Roehl, Foss. Fl. Stei phalens, p. 153, Pl. XXII, Fig. 12; Kidston, Foss. Fl. Radstock Ser., p. 403, Pl. XXIII, Fig. 5.

[2] Fl. foss. Commentry, atlas, Pl. LXXII, Fig. 8.

[3] Ad. Brongniart, Graines foss. silicif., 1881, Pl. II, Fig. 1; Renault and Zeiller, l. c., Fig. 3.

[4] Quart. Jour. Geol. Soc. London, XXVIII, 1872, p. 356, Pl. XXVII, Fig. 4.

[5] Verst. böhm. Kohlenablag., II, 1875, p. 46 (221), Pl. XX, Figs. 4–6.

[6] Geol. Surv. Ark., II, 1860, Pl. IV, Figs. 4, 4a; Coal Flora, Atlas, 1879, Pl. LXXXV, Figs. 34,

[7] Newberry, op. cit., p. 375, Pl. XLIII, Figs. 11, 11a.

[8] Dawson, op. cit., p. 60, Pl. XIX, Fig. 219.

[9] Coal Flora, III, Pl. CIX, Fig. 22.

[10] Pl. A, Fig. 6.

[11] Geol. Surv. Ohio, vol. I, pt. 2, 1873, p. 370.

her broader and smooth. The envelope or sarcotest is
is and Carruther's species, which is described as hav-
inning along one side of the fruit within and parallel to
emarginatum Brongn. has the nucleus more ovate and
much thicker, especially above, while *C. Gutbieri* Gein.
r, thinner, with the endotest less acute, not so distinctly
base, the sarcotest being thin and rounded. *C. latum*
C. major Gr. 'E. have their endotestæ broader, that
being less distinctly mucronate, with a line from the
ne summit, while the endotesta of the latter is less deeply
onulatus Lx. often has a central depression on the
s, the sarcotest thickened above and prolonged down-
se, and *C. pachytesta* Lx. has the envelope rounded and
e and prolonged below, the endotesta being larger, with
pedicel. None of these are described as having a thinly
s or endotesta like that of *C. lineatus*.
orth end of the Bay state lease, Oswego, Joplin, Jasper

RESULTS.

IN CORRELATION OF WESTERN TERRANES WITH EAST-
RN SERIES BY MEANS OF FOSSIL PLANTS.

s are most important in preventing a satisfactory deter-
age of the plants and the correlation of their containing
thers whose stratigraphical position has been determined.
the want of even a single paleobotanical section of the
pi deposits with which to compare our flora. With the
he flora from near the base of the Lower Coal-measures
ty, Missouri, and a supposed subconglomerate flora from
ounty, Arkansas, the floras of the entire Carboniferous
eat western regions are essentially unknown. Although
horizons have been reported in the different state publi-
urring at various localities in the Lower, Middle, and
asures of the trans-Mississippi states, no one has ever
, I believe, nor have we so much as a published list of
m any fixed horizon.[1] Considering these circumstances
estly hoped that geologists in these states will cooperate
nd identifying plants from as many fixed horizons, and
ose horizons, as possible, in order to work out the floral
d characteristics of the various stages in the different
ctions of the Coal-measures, with a view to their final

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eptions to this are the two small collections identified by Lesquereux from Ottawa
sas, whose stratigraphic position is only indefinitely indicated; and a few plants
e author in 1860 from Jenny Lind and James Fork, Arkansas, considered by him
e, but which appear on a careful analysis to belong to the true Coal-measures.
nt that these two isolated fragments, whose position and relation to the entire
oximately fixed, can at best be of very slight correlative value.

utilization in constructing standard paleobotanical sections of t
boniferous in those areas.[1]

The second difficulty lies in the unreliability of the recorded geo
ical distribution of the species and of the geological position as
to some of the localities, seriously impairing the homotaxial
worthiness of our Carboniferous flora except within broad limits
has already been suggested in the discussion of several species.

No close or accurate correlation, by means of paleobotany,
boniferous plant beds in the eastern or western areas can be
plished until a close study of the plants shall have been made
basis of their exact stratigraphical occurrence as well as fr
standpoint of systematic botany, and it will always be use
attempt to employ the fossil floras of any region in determining
stages until they shall have been collected and studied by hori
the same sedimentary basin or general region. It is not en
collect and label fossil plants merely by localities; the flora
horizon in the section should be collected and studied by itsel
methods so often followed by the paleobotanist must be exchan
the minute and exact method of the best paleozoölogist if the paleo
of the Carboniferous or any other series is to fulfill its capa
usefulness and receive the recognition that the paleontology of
prehensive, highly differentiated and sensitive a class of orga
deserves.

Lack of confidence in the recorded distribution and range
species, in view of known errors in geological and geographical d
tion, as well as the want of actual knowledge of the floras
horizons, whose stratigraphical relations to the series in a given
has been ascertained, makes it too often impossible to determ
age of any undetermined horizon in the eastern region with mo
cision than to indicate the group to which it belongs. The inac
and liability to error involved in attempting definitely to co
isolated horizons at so remote distances as Missouri, Arkan
Texas, with eastern paleontological sections, even when the la
good, is a common experience among paleontologists.

DISTRIBUTION OF THE SPECIES.

Being in the present case dependent almost wholly on such
have been published on the floras of the Carboniferous in the
states, I have attempted to reach only some general conclusio
the probable age of the outliers by consulting the recorded distr
of the species. The following list, compiled chiefly from the Coa
gives their geographical and geological range as stated by vari
thors. I have not attempted to revise the geological assignmen
localities according to more recent geological researches, exce

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[1] The incompleteness of the botanical record, even in the eastern areas, will be roughly i
the discussion of the distribution of the species.

ing such errors as remain to be relatively unimportant
s in the present case, only the series to which the ter-
ther than their approximate horizon.[1]

CALAMITES RAMOSUS Artis.

ate, Helena, Ala. [Lesq.], (XII?); Centerville, Tenn. [Lesq.],
.] (XII? or XIII?).
s Series, Campbell's Ledge, near Pittston, Pa. [I. C. W.—Lesq.];
hio [Lesq.—Newby.].
Measures, B. Mazon creek, Morris, Colchester, Murphysboro,
lington bed, Cannelton, Pa. [I. C. W.—Lesq.]; D. Duquoin, Ill.
y. [Lesq.], (?) 500 feet above Millstone Grit, near Gadsden, Ala.
) Osage City, Lawrence, Ottawa, Kans. [Lesq.] (XV?), R. I. [Lesq.].
D. or E. Brown's coll., near Pittston, Pa. [Lesq.]; E. Butter
[Lesq.]; E. or F. Wilkesbarre, Pa. [Lesq.]; F.? Orchard-mine vein
nd Salem vein, Pottsville, Pa. [Lesq.].
ures, Nova Scotia [Daws.].

NNULARIA STELLATA (Schloth.) H. C. Wood.

, Ohio [Lesley].
s Series, Campbell's ledge, Pittston, Pa. [I. C. W.—Lesq.].
Measures, B. Murphysboro, Mazon creek, Colchester, Ill, [Lesq.];
arlington bed, Cannelton, Pa. [I. C. W.—Lesq.]; Clinton, Mo.
in, Ill. [Lesq.].
en Measures, 20 feet below Pittsburg coal, Wheeling, W. Va. [F.

Measures, St. Clairsville, Ohio [Lesq.].
oniferous, roof shales of Waynesburg coal, Cassville, W. Va. [I.

C. Shamokin, Butler dam, Pittston, Pa. [Lesq.]; E. or F. Port
Pittston, Pa. [Lesq.]; F. Oakwood coll., Pittston, Pa. [Lesq.];
Lesq.].

NNULARIA SPHENOPHYLLOIDES (Zenk.) Gutb.

e Series, Campbell's ledge, Pittston, Pa. [I. C. W.—Lesq.].
l Measures, B. Murphysboro, Mazon creek, Morris, Colchester,
arlington beds, Cannelton, Pa. [I. C. W.—Lesq.]; Clinton, Mo.
Lind, James Fork, Ark. [D. W.—Lesq.]; Centerville, Tenn.
q.]; Ind. [C. A. W.[; Pa. [Lesq.]; Lawrence, Kans. [Lesq.].
en Measures, 20 feet below Pittsburg coal, Wheeling, W. Va. [F.

Measures, Pomeroy, O. ["G" of Lesq.].
oniferous, Roof shales of Waynesburg coal, Cassville, W. Va. [I.

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talogue of distribution, when the names of two authors, separated by a dash.
ets, it will be understood that the last named is authority for the identification
articular locality, while the first named is responsible for the age assigned to
an numbers are those used by the Geological Survey of Pennsylvania. In each
calities which have been referred to some horizon are given first. The inter-
entheses indicate that the stages or horizons of the following localities are
t imply doubt as to the occurrence of the species at a given point. The Roman
s with interrogations are used to suggest a different group, as apparently indi-
. Errors will doubtless be found by geologists in the field, and such corrections
ay give will in the end, I trust, be conducive to a better understanding of the

Anthracite Series, A. Shamokin [Lesq.]; E. or F. Port Griffith [Plainsville [Lesq.]; M. Pottsville, Tremont [Lesq.].

Upper and Middle Coals, Nova Scotia [Daws.].

SPHENOPHYLLUM CUNEIFOLIUM (Sternb.) Zeill. (=*S. erosum*

XII. *Conglomerate Series*, Cuyahoga Falls, O. [Lesq.]; Talmadge, (Newby.]; Centerville, Tenn. [Lesq.] (XIII ?).

XIII. *Lower Coal Measures*, C. Clinton, Mo. [Lesq.].

XV. *Upper Coal Measures*, Pittsburg coal at St. Clairsville, O. [Lesq.].

Middle Coal Formation, Nova Scotia [Daws.].

SPHENOPHYLLUM MAJUS Bronn.

XIII. *Lower Coal Measures*, B. Spring Creek, Ind. [Lesq.]; Mazon [Lesq.]; C. Clinton, Mo. [Lesq.]; Darlington bed, Cannelton, Pa. [James Fork, Ark. [D. W.—Lesq.]; R. I. [Lesq.].

XV. *Upper Coal Measures*, G. Barnesville, O. [Lesq.].

XVI. *Permo-Carboniferous*, Roof shales, Waynesburg coal, Cassville Union, W. Va. [F. and W.].

Anthracite Series, E. or F. Port Griffith; Wilkesbarre, Pa. [Lesq.].

Upper and Middle Coal Measures, Nova Scotia [Daws.].

PINNULARIA sp.

Not characteristic of any horizon or group.

DIPLOTHMEMA GENICULATUM (Germ. & Kaulf.) Stur.

Middle Carboniferous and transition to Upper Carboniferous of Englan and Bohemia.

MARIOPTERIS (PSEUDOPECOPTERIS) MAZONIANA Lesq. sp.

XIII. *Lower Coal Measures*, B. Mazon Creek, Ill. [Lesq.].

MARIOPTERIS (PSEUDOPECOPTERIS) DECIPIENS Lesq. sp.

XI. *Subconglomerate*, Dade Co., Ga. [Lesq.] (XII?); Helena Coal Mines, A (XII?).

XIII. *Lower Coal Measures*. James Fork, Jenny Lind, Ark. [D. W.—L Buren, Ark. [D. W.]. D. or E. Sullivan Co., Ind. [Lesq.].

Anthracite Series, A. Shamokin, [Lesq.]; F. ? Oakwood Colliery, W [Lesq.].

Middle Coal Formation, Nova Scotia [Daws.].

SPHENOPTERIS OBTUSILOBA Brongn.

X. *Pocono*, New River, W. Va. [Lesq.].

XI. *Subconglomerate*, West Va. [Lesq.].

XII. *Conglomerate Series*, Cuyahoga Falls, O. [Lesq.]; Campbell's Ledge Pa. [Lesq.].

XIII. *Lower Coal Measures*, B. Colchester, Ill. [Lesq.]; C. Clinton, Mo (?) Jenny Lind, Ark. [D. W.—Lesq.].

Anthracite Series, F. ? Oakwood coll., Wilkesbarre, Pa. [Lesq.].

Middle Coal Formation, Nova Scotia [Daws.].

SPHENOPTERIS MACILENTA L. & H.

ick seam, Jefferson Co., Ala., along the Black Creek, near Gads-
XII?); (?) Ark. [Lesq.] (XIII?).
te Series, W. Va. [F. & W.].
Measures, C. Clinton, Mo. [Lesq.]; Cannelton, Pa. [Lesq.].

SPHENOPTERIS LACOEI D. White.

Measures, Clinton, Mo. [D. W.]; Cannelton, Pa. [D. W.].

SPHENOPTERIS HILDRETI Lesq.

Measures, Union, Greenup, and Carter Cos., Ky. [Lesq.].

SPHENOPTERIS, species.

rs to be related to *S. nummularia*.

PECOPTERIS DENTATA Brongn.

te Series, Campbell's Ledge, Pittston, Pa. [Lesq.]; Cuyahoga
ewby.].
Measures, B. Morris, Mazon Creek, Colchester, Ill. [Lesq.]; C.
sq.]; Darlington, Pa. [I. C. W.—Lesq.]; D. Duquoin, Ill.
[Lesq.].
ren Measures, 20 feet below Pittsburg coal, near Wheeling, W.

Measures, G. Pomeroy, O. [Lesq.].
boniferous, Roof shales of Waynesburg coal at Cassville, W. Va.

D. or E. Brown's coll., Pittston [Lesq.]; G. Olyphant [Lesq.].
ation, Nova Scotia [Daws.].

(?) PECOPTERIS UNITA Brongn.

hich our specimens are most closely related, perhaps being iden-
of distribution as follows:
Measures, B. Mazon Creek, Colchester, Grape Creek, Ill. [Lesq.].
esq.]; C. Darlington-bed, Cannelton, Pa. [Lesq.]; D. Duquoin,
chtel, O. [Lesq.]; (?) R. I. [Lesq.].
, D. or E. Brown's coll., Pittston [Lesq.]; E. or F. Stanton and
kesbarre [Lesq.]; Port Griffith [Lesq.]; F.? Wilkesbarre [Lesq.];
.]; M. Gate and Salem veins, Pottsville [Lesq.].
r Carboniferous, Nova Scotia [Daws.].

PECOPTERIS LESQUEREUXII D. White.

al with forms indentified as *P. aspidioides* from Rhode Island
s to the group including *P. arborescens*, *P. cyathea*, etc.

NEUROPTERIS FIMBRIATA Lesq.

Measures, B. Mazon Creek, Murphysboro, Morris, Ill. [Lesq.];
d, Cannelton, Pa. [Lesq.]; E. Buchtel, O. [Lesq.]; (?) Jenny
—Lesq.].
Measures, G. St. Clairsville, Athens, O. [Lesq.]; (?) Marietta, O.

boniferous, Roof shales of Waynesburg coal, Carmichael's, Pa.
a. [I. C. W.—F. & W.].

Anthracite Series, D. or E. Brown's colliery, Pittston [Lesq.]; E. Br Pittston [Lesq.]; F. ? Oakwood coll., Wilkesbarre [Lesq.]; G. Olyphar M. Gate vein, New Philadelphia [Lesq.]; Pottsville [Lesley].

NEUROPTERIS SCHEUCHZERI Hoffm.

XIII. *Lower Coal Measures*, B. Morris, Murphysboro, Mazon Creek, Colc [Lesq.]; Spring Creek, Ind. [Lesq.]; Union Co., Ky. [Lesq.]; C. Darli Cannelton, Pa. [Lesq.]; Clinton, Mo. [Lesq.]; D. or E. Sullivan Co., In (?) Shirley Knob, Cass township, Pa. [I. C. W.]; R. I. [Lesq.]; O [Lesq.]; Jenny Lind, James Fork, Ark. [D. W.—Lesq.]; Ottawa, O Kans. [Lesq.]; Mansfield, Mass. [Marcou].

XIV. *Lower Barren Measures*, 20 feet below Pittsburg coal, near Wheel [F. & W.]; ? Bellaire, O., 20 feet below Pittsburg coal [F. & W.].

XV. *Upper Coal Measures*, G. St. Clairsville, Pomeroy, O. [Lesq.]; Pitt near mouth Redstone Creek, Pa. [Lesley].

XVI. *Permo-Carboniferous*, W. Va. [F. & W.].

Anthracite Series, A. Shamokin; C. Ontario coll., Pittston; D. Carbon H D. or E. Brown's coll., Pittston; E. Yatesville; F. Wilkesbarre; G. Ol Gate Vein, Pottsville, Pa. [all Lesq.].

NEUROPTERIS JENNEYI D. White.

Nearest related to *N. Scheuchzeri*, but with a facies somewhat Odontopt parable to *O. Wortheni*.

NEUROPTERIS RARINERVIS Bunb.

XIII. *Lower Coal Measures*, B. Murphysboro, Mazon Creek, Mor Creek, Ill. [Lesq.]; Union Co., Ky. [Lesq.]; C. Cannelton, Pa. [Lesq. Mo. [Lesq.]; Kittanning coal, W. Va. [F. & W.]; D. Duquoin, Ill. [Les

XIV. *Lower Barren Measures*, 20 feet below the Pittsburg coal, near W. Va. [F. & W.].

Anthracite Series, E. Yatesville; E. or F. Wilkesbarre; F. Wilkesbar phant, Pa. [Lesq.].

Middle Carboniferous, Cape Breton [Bunb.]; Nova Scotia [Daws.].

NEUROPTERIS CAUDATA D. White.

Nearest related to *N. Loshii*, as seen in specimens from the Kittanning.

NEUROPTERIS FLEXUOSA Sternb.

X. *Pocono*, Lewis tunnel, W. Va. [Lesq.—Font.].

XI.? *Subconglomerate*, New river, W. Va. [Font.] (XII?).

XIII. *Lower Coal Measures*, B. Murphysboro, Mazon Creek, Morris, Il C. Cannelton, Pa. [I. C. W.—Lesq.]; Kittanning coal, W. Va. [F. & W. base of series at Dudley, Pa.; Shirley Knob, Pa. [I. C. W.].

XIV. *Lower Barren Measures*, 20 feet below the Pittsburg coal, near Wh Va. [F. & W.].

XVI. *Permo-Carboniferous*, Roof shales of Waynesburg coal, West Uni [F. & W.]; Carmichael's, Pa. [F. & W.].

NEUROPTERIS TENUIFOLIA (Schloth.) Sternb.

XI. *Subconglomerate*, W. Va. [Lesq.]; Chester group, Ill. [Lesq.]; and Lower Sewanee, Tenn. (Lesq.]; Male's Coal, Ark. [Lesq.] (XII?).

XII. *Conglomerate Series*, Tipton Run, Pa. [I. C. W.].

oal Measures, B. Murphysboro, Mazon Creek, Morris, Colchester, Ill.
nelton. Pa. [Lesq.]; Clinton, Mo. [Lesq.]; D. or E. Ky. [Lesq.] (?)
mes Fork, Ark. [D. W.—Lesq.]; R. I. [Lesq.]; Tuscaloosa, Ala.

al Measures, G. St. Clairsville, O. [Lesq.].
es, A. Shamokin; E. or F. Wilkesbarre; G. Olyphant, Pa. [all Lesq.].

NEUROPTERIS cf. TRICHOMANOIDES Brongt.

t from specimens of *N. trichomanoides* Lesq. from Cannelton, though
osely to the figures and descriptions of foreign specimens under that

NEUROPTERIS DILATATA (L. & H.) Lesq.

oal Measures, Clinton, Mo. [D. W.].
al Measures, Pomeroy, O. [Lesq.—Lyell].

NEUROPTERIS, species.

trichomanoides, and possibly representing cyclopterid pinnules of
tenuifolia.

DICTYOPTERIS SQUARROSA Ett. sp.

iferous of Europe.

APHLEBIA ARBORESCENS Lesq. sp.

oal Measures, B. Morris, Ill. [Lesq.]; (?) Mo. [Hambach].

SIGILLARIA, species.

entical with specimens from Murphysboro, Ill., and Preston coll.,
Pa.

CORDAITES COMMUNIS Lesq.

andstone, Rushville, O. [Lesq.].
oal Measures, Darlington beds, Pa. [Lesq.]; C. Clinton, Mo. [Lesq.].

CORDAITES cf. COSTATUS Lesq.

as yet been identified, I believe, only from the Kittanning (Lower
at Cannelton.

CORDAIANTHUS, species.

ive value.

CORDAICARPUS LINEATUS Lesq.

nerate, Ark. [Lesq.]. (XII ? or XIII ?).
oal Measures, C. Cannelton. Pa. [Lesq.].

Summary of distribution of species in the United States.

Species.	Pocono. X.	Subconglomerate. XI. ?=XII	Conglomerate series. XII.	Lower Coal Measures. ?=horizon unknown.	Barren. XIV.	Upper Coal Measures. XV.	Permo-carboniferous. XVI.	Anthracite of Pennsylvania.				British provinces.		
								A, B, C.	D, E, F.	G.	M.	Lower Coal Measures.	Middle Coal Measures.	Upper Coal Measures.
Calamites ramosus		Tenn.?, Ala.,? Ark.?	Pa., O.	(B) Ill., (C) Pa., (D or E) Ky., (?) Ala., Kans., R. I., Ark.					D or E, E or F, F.?		M.		×	
Annularia stellata	O		Pa	(B) Ill., Ky., (C) Pa., (D) Ill., Ark.	W. Va	O	W. Va	C	D or E, E or F, F.	G				
Annularia sphenophylloides			Pa	(B) Ill., (C) Pa., Mo., (?) O., Ark., Tenn., R. I., Ind., Kans.	W. Va	O	W. Va	A	E or F	G	M		×	×
Sphenophyllum cuneifolium			O., Tenn.	(C) Mo		O							×	
Sphenophyllum majus				(B) Ind., Ill., (C) Pa., Mo., (?) Ark.		O	W. Va		E or F				×	×
Mariopteris mazoniana				(B) Ill										
Mariopteris decipiens		Ga? Ala? Ark?		(D or E), Ind., (?) Ark				A	F?				×	
Sphenopteris obtusiloba	W. Va	W. Va	Pa., O?	(B) Ill., (C) Mo., (?) Ark.					F?				×	
Sphenopteris macilenta		Ala., ? Ark.?	W. Va	(C) Mo., Pa., (?) Ala										
Sphenopteris Lacoei				(C) Pa., Mo										
Sphenopteris Hildreti				Ky										
Pecopteris dentata			Pa., O.	(B) Ill., (C) Pa., Mo., (D) Ill., (?) R. I., Ark.	W. Va	O	W. Va		D or E	G			×	
(?) Pecopteris unita				(B) Ill., Ky., (C) Pa., (D) Ill., (E) O., (?) R. I.					D or E, E or F, F.?	G	M		×	×
Neuropteris fimbriata				(B) Ill., (C) Pa., (E) O., (?) Ark.		O	Pa., W. Va		D or E, E, F.?	G	M			
Neuropteris Scheuchzeri				(B) Ill., Ind., Ky., (C) Pa., Mo., (D. E.?) Ind., (?) Pa., R. I., Ill., Ark., Kans.	O., W. Va	O., Pa	W. Va	A, C	D, D or E, E, F.	G	M			
Neuropteris rarinervis				(B) Ill., Ky., (C) Pa., W. Va., Mo., (D) Ill.	W. Va				E, E or F, F.	G			×	
Neuropteris flexuosa	W. Va. (?)	W. Va.?	W. Va	(B) Ill., (C) Pa., (?) Pa	W. Va		Pa., Va							
Neuropteris tenuifolia		Ill., Tenn.,? Ark.,? W. Va.?	Pa	(B) Ill., (C) Pa., Mo., (D) Ky., (?) R. I., Ala., Ark.		O		A	E or F	G				
Neuropteris dilatata				(C) Mo		O								

E OUTLIERS AS DETERMINED BY THE DISTRIBUTION AND FACIES OF THE FLORA.

ıspection of the tabulated summary of the twenty-two spe-d from other regions shows the occurrence in the Lower res of all the old species of our flora, though only four, less th, are confined thereto. Three are said to occur in the Po-verly and eight, or a little more than one-third, in the Sub-te. Only nine, including five of the above, are recorded in nerate series, or Interconglomerate, though there is prob-ion between XI and XII, some geologists believing several beds referred to in the Coal Flora under XI to belong in II. However this may be, it is clear that, so far as known, e-half of our species occur below the Lower Productive Meas-only are reported from the Lower Barren Measures, a singu-less due to ignorance of the flora of that series, as will be ter. But nine species have been described from the Upper res or Monongahela river series, and seven species, all but one in the preceding column, are also reported from the Permo-us, above the Waynesburg coal. However, six of the plants ar in the Upper or Permo-Carboniferous, having survived on of the Barren Measures, are also included among those elow the Lower Productive Measures (XIII). These species, tical distribution, can therefore be of little assistance in cor-he remaining six species which have been found below the -measures have all a distribution also within XIII. This nent is, however, fully counterbalanced by that occurring VI, of which four species have not been found below XIII, , perhaps more, do not go below the Conglomerate series is without taking into consideration the time interval and unknown flora represented by the Barren Measures (XIV). erefore, by the recorded distribution in the bituminous re-dentity of our flora is evidently with that of the Lower Coal-III).

now to the anthracite region, we find five represented in coals, eight in coal G of the Olyphant section, and five e and Salem veins of the upper anthracite. The largest ion, twelve species, is, however, in coals D, E, and F of this taking this into account, together with the affinity of the Olyphant horizon (G), the age of our flora, judged by the thracite distribution, would be apparently synchronous of the anthracite series, a horizon higher than that indi-ly by the recorded distribution in the bituminous series.

g again to the distribution in the Lower Coal-measures of ous fields, it is of some interest to see in what horizon the nber of species appear to be represented, though the conclusions that may be drawn from such a comparison are of little a value. We find fourteen species in the coal B at Mazon creek, M etc., in Illinois, eighteen in the Middle Kittanning (C) at Cann Pennsylvania, or its supposed chronologic equivalent at Clinton, ac ing to Lesquereux, while nine come from coal D or E in Illinois and tucky. The percentage of identity with the Cannelton-Clinton fl very striking, comprising eighteen out of twenty-two old specie furnishes a strong argument for considering our flora as of nearl same age, i. e., about the middle of the Lower Coal-measures.

But the materials for the distribution of our coal flora are as y scanty to warrant great faith in mere percentages and numerical tities. Until the floras of all the stages of all the Coal-measures have been worked out systematically from a greater range of loca proofs by numerical comparisons will always be liable to mi Other things being equal, a flora from a horizon but little known botanically will, in correlating on the numerical basis, be attr towards the nearest allied flora that is relatively well known, thoug horizon may be quite different. Fragmental floras derived more o remotely from the same horizon may seem to have more in commo the developed flora of an entirely different stage than with each It may even happen that none of the small collections contain o resent the floral associations really more characteristic of that ho As yet the flora of no horizon or series in the bituminous coal except, perhaps, the Permo-carboniferous, has been systemat studied and published. Only a few horizons have been spe worked, and these have been examined only in single localities stricted vicinities. The collections of Mr. Lacoe from Campbell's (XII) in the anthracite area, of Mr. I. F. Mansfield from the Darli bed, just above the Middle Kittanning, at Cannelton, Pennsylv the collection from the Mazon creek horizon (B) at that place a Colchester, Murphysboro, and Morris, Illinois, and the collections by Dr. Britts from the Lower Coal Measures in the neighborh Clinton, Missouri, developing these respective floras in isolated re are loadstones toward which the new floras of unexplored horizo of remote regions, when developed in a different environment, a evitably attracted, for want of a relatively equal elaboration of a closely allied flora, coming either from the same horizon or one s graphically nearer. No paleozoologist of good standing will insis collections made from one or two strata in a single locality, or e narrow area, represent the fauna existing under various cond throughout a complex group of great geographical extent. Owi the greater bulk of the specimens and the greater labor of colle them, it is seldom that a collection of fossil plants includes more a portion of the flora of the locality where they are obtained.

Without stopping to discuss the meager materials, representing floras, from various regions in the Conglomerate (XII) and subj tratigraphical relations of whose habitats are not yet under- reed upon, a brief review of the work done on the paleobo- ore important portion of the series is sufficient to indicate in neral way the fragmentary condition of our knowledge of ' the various stages and regions of the American Coal-meas- Pennsylvania, whose Carboniferous paleobotany is best only flora that has been published from any horizon in ituminous measures above the Conglomerate series is that s just below the Middle Kittanning, and this is known only ions made at Cannelton, though the horizon is said to be ys well filled with good plant remains. A few plants from Carboniferous (XVI) of this state are described in Fontaine hite's Permian Flora. In West Virginia only a few species ittaning and Upper Freeport (XIII), mostly without locali- oned in the above work, are known between the Con- series (XII) and a horizon twenty feet below the Pitts- The list of plants, about thirty in number, from the latter ingle locality, Wheeling, constitutes essentially all that is f the entire flora of the Barren Measures (XIV) throughout . A few unimportant fragmentary lists from the Lower res and the Upper Coal-measures represent all the species any stage between the Subcarboniferous and the Permo- us of that state. Nothing is known of the plants above iana or Kentucky, although higher horizons are present as in Tennessee, whose Paleozoic flora above the Conglom- is supposed to be wholly unknown. Nothing better can eorgia or Alabama, except to mention a few plants which y stated to belong to a horizon above the Millstone Grit, in ate, near Gadsden. The exploited flora of Illinois is practi- l to that of the Lower Coal-measures (XIII), only about ies having been described among four localities of uncer- n in the Upper Coal-measures. Passing westward and south- d that essentially nothing is known of the floras of the en- ss of the Carboniferous in Iowa, Missouri, Arkansas, Indian nd Texas, with the exception of a flora, mostly without alities, recorded as Subconglomerate in Arkansas, and the cted in the vicinity of Clinton, in the Lower Coal-measures

comes quite probable that correlations made now on a basis ges may require serious revision when the floras of the stages, many of which are yet wholly unexplored, shall nade known, by means of collections gathered from many idely distributed stations. We shall probably continue to lora of any new region or horizon corresponding to a stage v the highest percentage of species identical or allied with

the flora listed from Cannelton in Pennsylvania or that from the
horizon of Illinois, until the floras of the Freeport horizons, the
Measures (XIV), and the stages of the Upper Coal-measures (
at least as well known, relatively, as those represented at Canne
Morris. Even the more ancient or more recent types can not hav
proper weight until the presence or absence of those types in the
mediate or adjacent stages is more satisfactorily indicated by s
ing at various localities in those stages and studying the plants.

The occurrence of more ancient or modern types in a local flor
liable, when used as coordinative evidence within too narrow lin
lead to error as is correlation by percentages, and from the same
cause. The best relative results should be obtained by employin
methods.

While on the basis of numerical affinities our flora is largely id
with that from Clinton, it appears when considered as to its fa
present a rather more recent aspect. Although the round-pi
sphenopterids are present the lycopods are almost wholly a
This may be due to the upland character of the flora, a con
that may otherwise disturb any arguments based on the asp
facies, of the flora. The number of neuropterids, comprising ov
third of the flora, is very remarkable and may perhaps be due
above circumstance. But the occurrence among them of several
nerved species would seem to indicate a younger flora. No
peculiar to the Lower Carboniferous are present, while the affini
the new *Pecopteris* and *Sphenopteris* species are also among more
forms. Finally, as a negative argument, may be mentioned th
siderable number of forms which are either new species or which
somewhat from anything described from the Lower Coal-measu
found among the great quantities of material from the coals nea
ton, Henry County, now in my hands. It is not improbable th
exploration of the measures above the horizons at Clinton, all
wholly unknown, may reveal there new forms among the inter
but unstudied Middle and Upper Carboniferous floras of the
Mississippi regions.

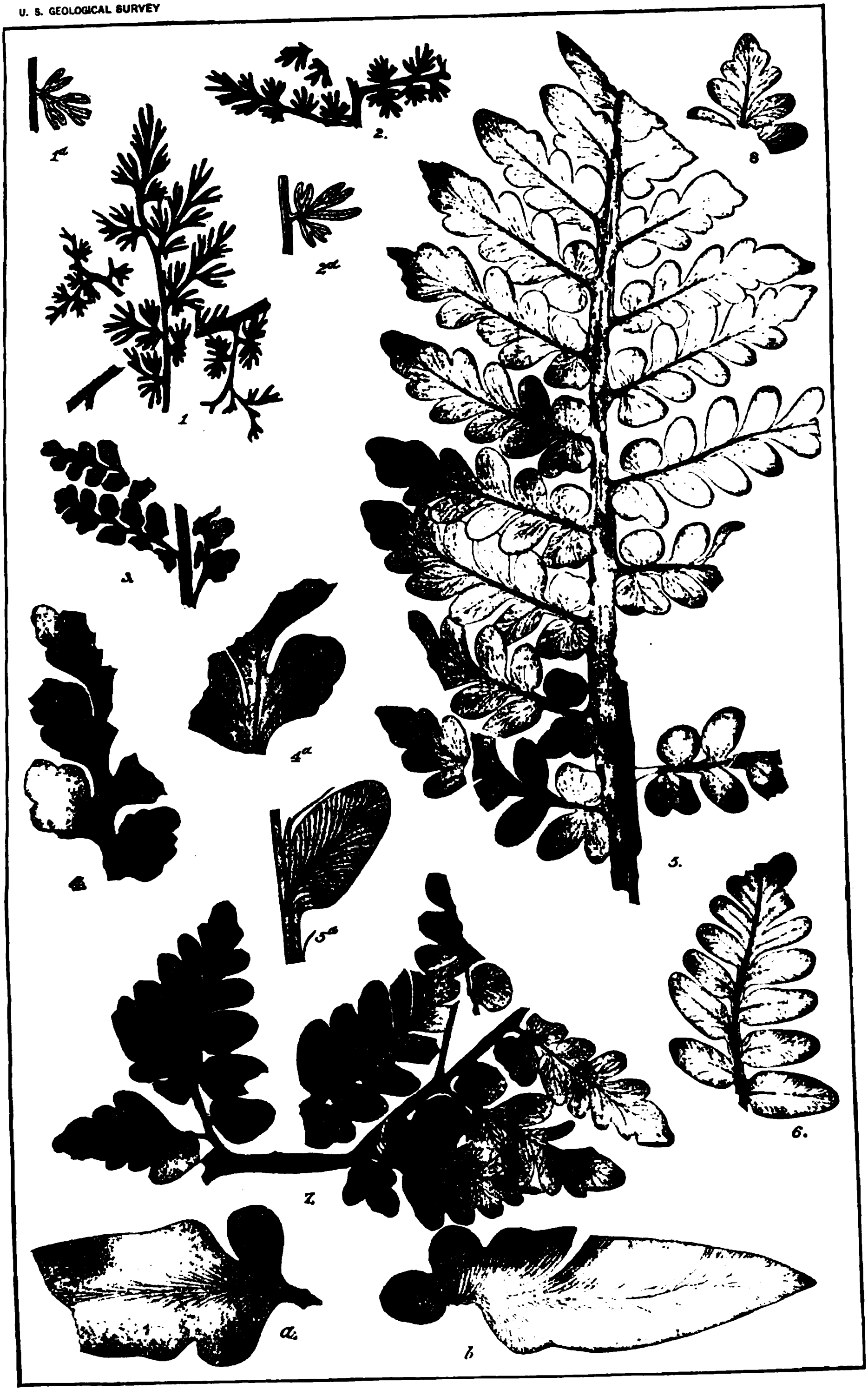
CONCLUSIONS.

The flora of the outliers in southern Missouri, so far as exhib
these collections, is, as is indicated above, comprised chiefly of f
number of which are new, while others have not been identified
continent before. It is characterized by a preponderance of n
terids, the presence of several thick-pinnuled spenopterids, the s
of calamarian remains (unless we include *Spenophyllum*), and the
entire absence of the *Lycopodineæ* the only vestiges of the latter
the leaves of a single species.

From this examination of the identities and affinities of its s
and their distribution, as well as from the facies and elements

onclusion is reached that the plant-bearing terranes in ques-
; to the Lower Coal-measures, while the horizon indicated,
proved by the flora as a whole, appears to be rather younger
which has furnished the Clinton plants. If such be the case
d zinc ores of the region must have been deposited at some
sequent to the formation of a stage probably about the mid-
the upper half of the Lower Coal-measures.

PLATES.



DIPLOTHMEMA, MARIOPTERIS, SPHENOPTERIS, NEUROPTERIS.

PLATE I.

PLATE I.

DIPLOTHMEMA GENICULATUM (Germ. & Kaulf.) Stur. (pp. 44–46).

Fig. 1. Fragment of compound pinna, natural size.
1a. Pinnule, enlarged two diameters.
2. Segment from lower in the frond, better indicating the subpalmate of the pinnules, natural size.
2a Typical pinnule, enlarged two diameters.

SPHENOPTERIS, species (pp. 59, 60).

Fig. 3. Small pinnæ, showing acorn-shaped pinnules.

SPHENOPTERIS (PSEUDOPECOPTERIS) MACILENTA L. & H. (pp. 55, 56)

Fig. 4. Fragment of pinna, natural size.
4a. Similar fragment with detail of nervation, slightly enlarged.

MARIOPTERIS (PSEUDOPECOPTERIS) DECIPIENS Lx. sp. (pp. 47–52).

Fig. 5. Portion of secondary (?) pinna, natural size.
5a. Detail of ordinary pinnule, enlarged two diameters.
6. Pinna, with marginal wing, natural size.
7. Fragment of compound pinna, probably adjacent to a dichotomy, size.
8. Apex of secondary pinna, natural size.

NEUROPTERIS JENNEYI n. sp. (pp. 82–84).

Fig. 7a b. Fragments of two pinnules, on same rock with *Mariopteris decipi* 7, natural size.

PLATE II.

PLATE II.

Mariopteris (Pseudopecopteris) decipiens Lx. sp. (pp. 47–5

Fig. 1. Small pinnæ, natural size.
2. Fragment from compound pinna, with nervation, natural size.
3. Segment of compound pinna, natural size.
3*a*. Pinnules, enlarged two diameters.

Pecopteris (Asterotheca) Lesquereuxii n. sp. (pp. 65–67)

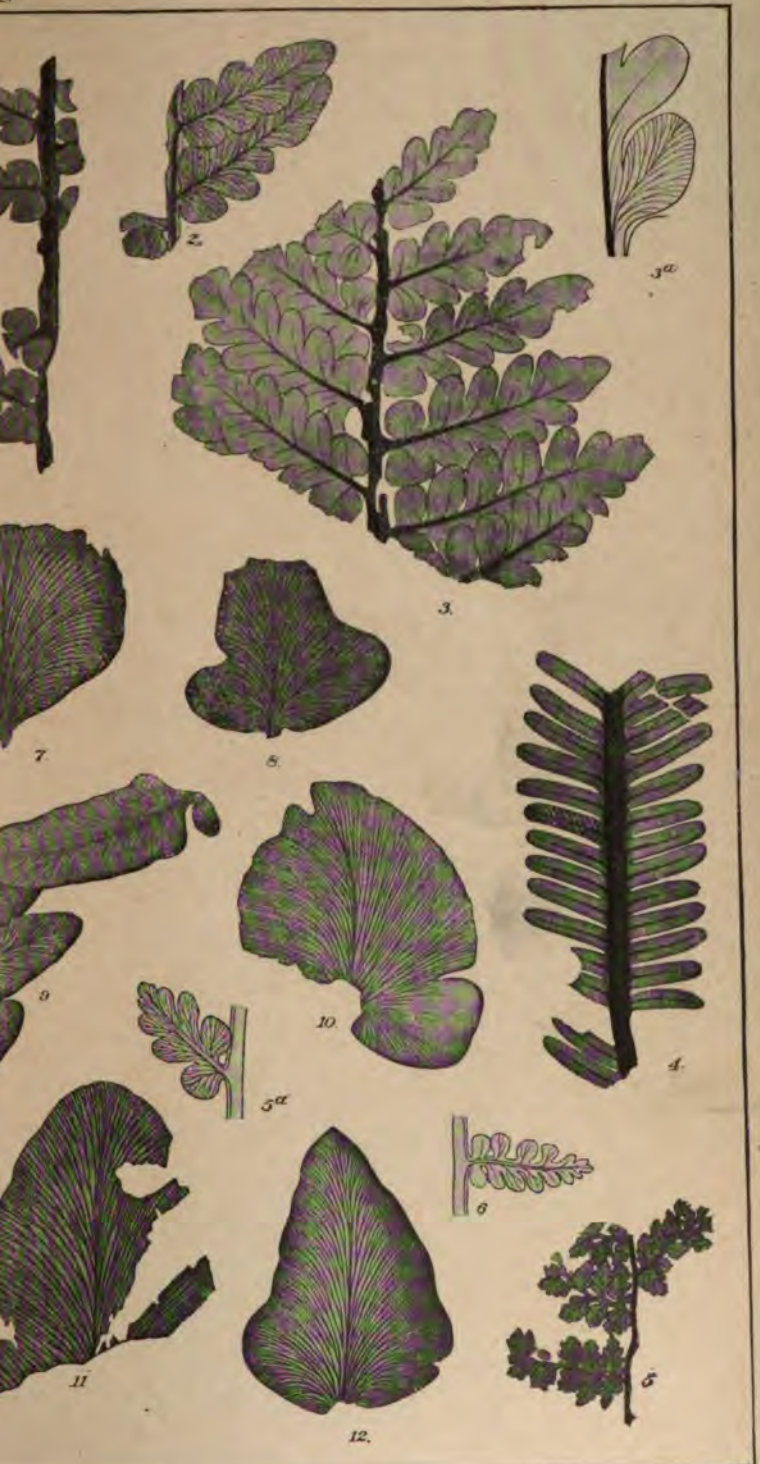
Fig. 4. Portion of pinna natural size.

Sphenopteris Lacoei n. sp. (pp. 56–58).

Fig. 5. Fragment of compound pinna, natural size.
5*a*. Pinnule, enlarged two diameters.
6. Another pinnule, enlarged two diameters.

Neuropteris Jenneyi n. sp. (pp. 82–84).

Fig. 7. Pinnule from low in the frond, natural size.
8. Small rachial pinnule, natural size.
9. Pinnules on penultimate rachis between the ultimate pinnæ, nat
10. Cyclopterid pinnule, natural size.
11. Large rachial pinnule, natural size.
12. Rachial pinnule, natural size.



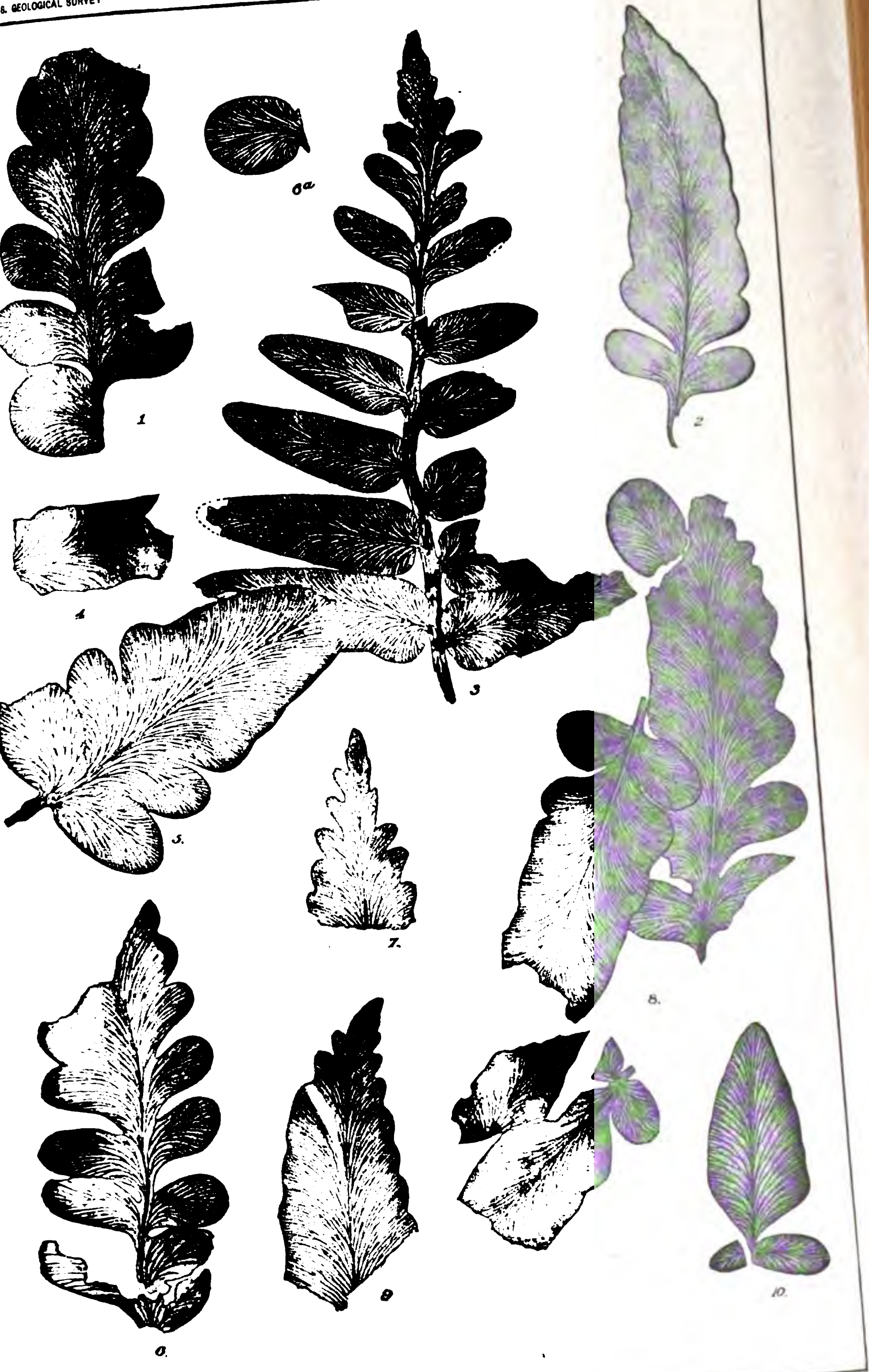
MARIOPTERIS, SPHENOPTERIS, PECOPTERIS, NEUROPTERIS.

PLATE III.

PLATE III.

NEUROPTERIS JENNEYI n. sp. (pp. 82–84).

Fig. 1. Portion of lobed pinnule, or ultimate pinna.
2. Upper part of a similar pinnule.
3. Top of secondary pinna.
4. Fragment on rock with Figs. 3 and 5.
5. Broad pinnule, showing the development of the basal lobes or pinnules.
6. Fragment from lower part of pinnule.
6a. Pinnule slightly enlarged.
7. Dentate-crenulate tip of pinnule.
8. Pinnules from which the basal lobes or pinnules have fallen.
9. Top of average pinnule.
10. Small rachial (?) trilobate pinnule.
All natural size.



NEUROPTERIS.

PLATE IV.

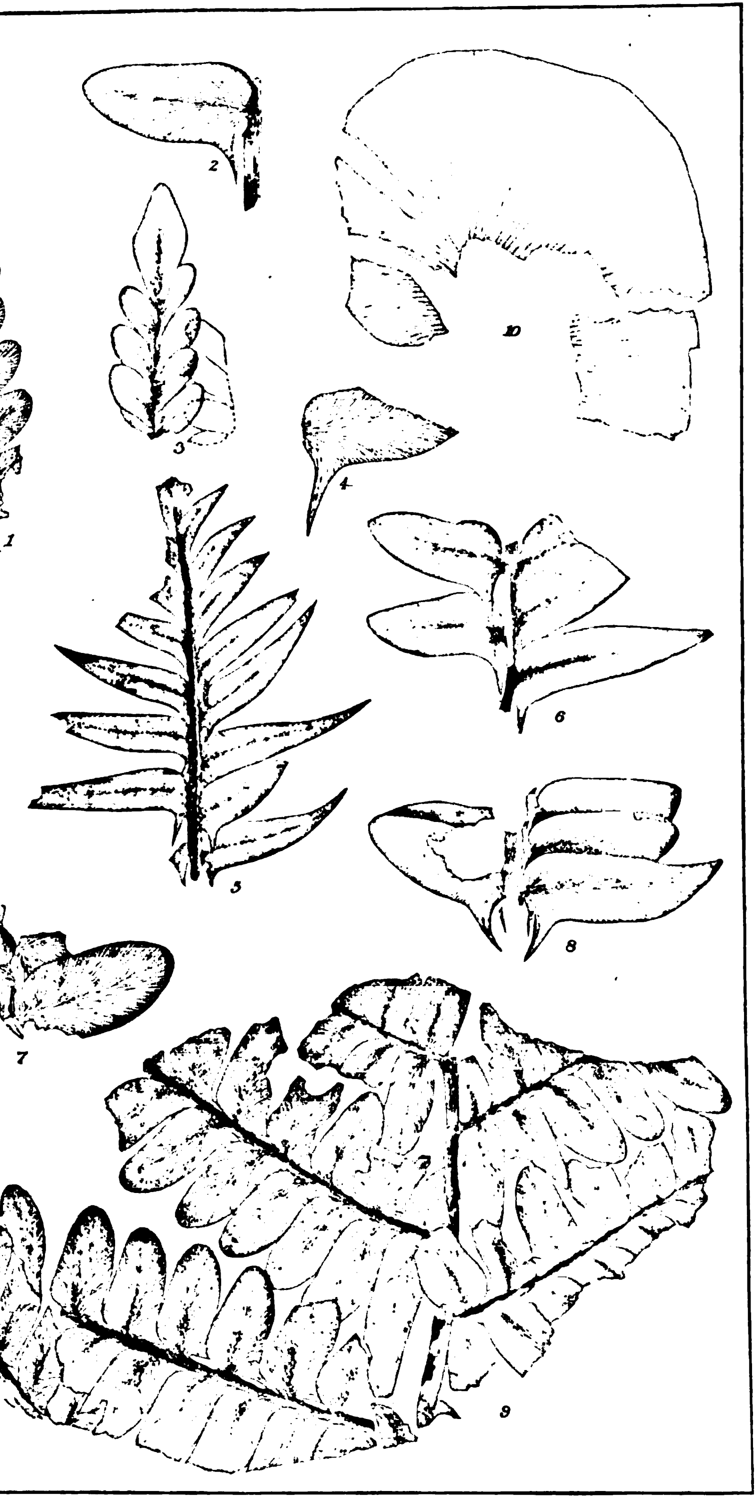
PLATE IV.

Neuropteris caudata, n. sp. (pp. 87–91).

Fig. 1. Pinna.
2. Typical pinnule.
3. Small pinna.
4. Base of pinnule.
5. Fragment from upper pinna.
6. Base of pinna, with elongated inferior pinnule.
7. Broad pinnules.
8. Basal portion of pinna.
9. Portion of middle secondary pinna.

Neuropteris cf. trichomanoides (Brongn.) Lx. (pp. 95, 96).

Fig. 10. Fragmentary pinnule.
All natural size.



NEUROPTERIS.

PLATE V.

PLATE V.

NEUROPTERIS FLEXUOSA Sternb. (pp. 91–93).

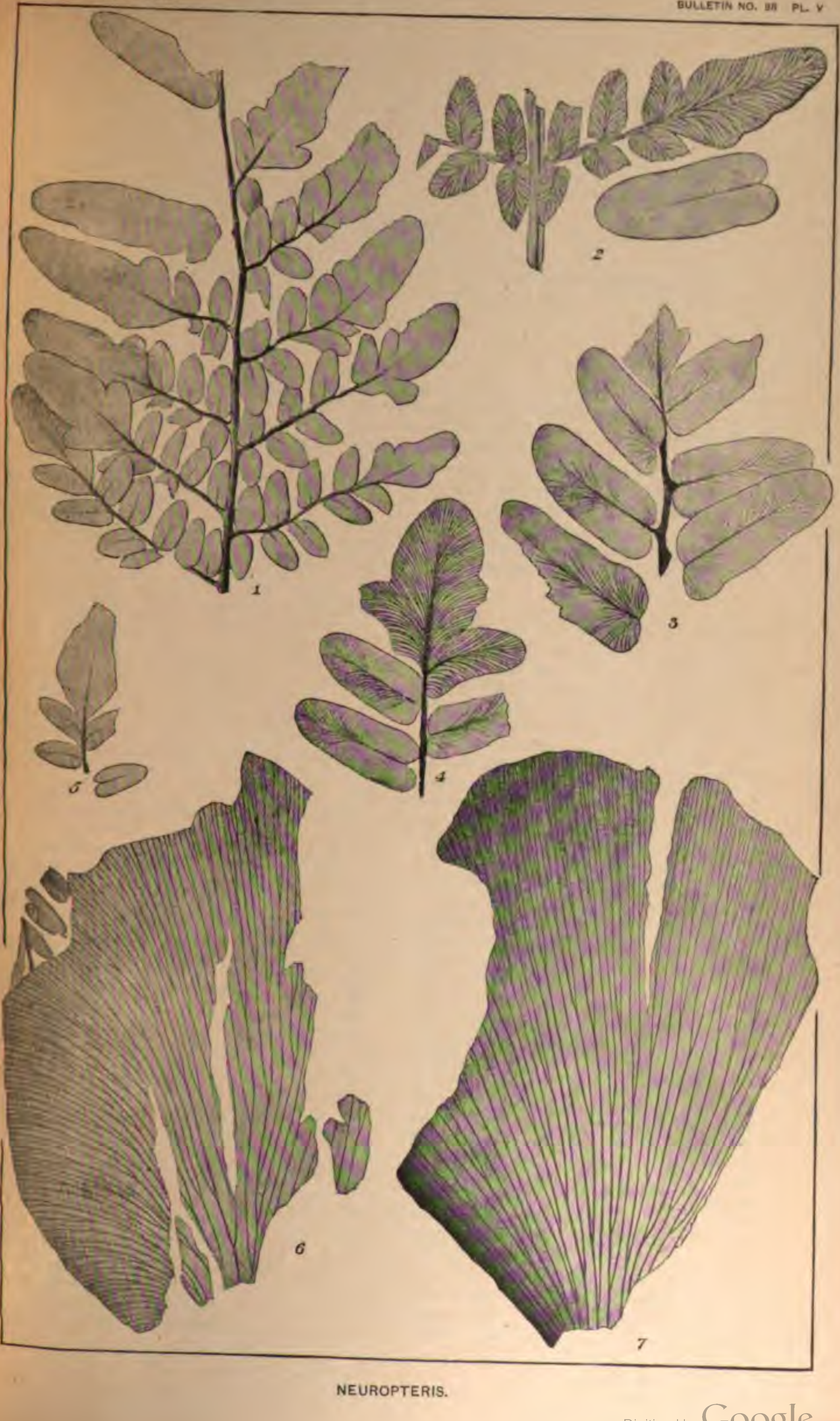
Fig. 1. Upper part of secondary pinna.
2. Short pinna, resembling N. missouriensis.
3. Tip of pinna.
4. Similar tip.
5. Tip of small pinna.

NEUROPTERIS, species (pp. 98, 99).

Fig. 6. Cyclopterid pinnule, possibly belonging to the preceding species, associated with pinnules of the latter. It may represent the following species.

NEUROPTERIS RARINERVIS, Bunb. (pp. 85–87).

Fig. 7. Cyclopterid pinnule, apparently belonging to this species.
All natural size.



NEUROPTERIS.

INDEX.

[Pages on which descriptions of species occur are printed in black-faced type.]

A.

Page.

Alabama, extent of knowledge of coal flora of, 119
Algacites, 101
Alicornopteris convoluta Kidst, 102
Altitude of plant habitat, 11
Annularia Sternb, **25–35**, 43
  brevifolia Brongn, 31, 32, 33, 34
  Emersoni Lx, 34
  fertilis Sternb, 25, 28
  Geinitzii Stur, 26, 28
  inflata Lx, 30
  longifolia Brongn, 25, 27, 30
  microphylla Roemer, 31
  microphylla Sauveur, 23, 34
  mucronata Schenk, 26, 30
  radiata Brongn, 17, 18, 23, 30
  ramosa Stur, 17, 23, 28
  ramosa Weiss, 17, **23**, 24, 30. 32
  sarepontana Stur, 31, 33, 34
  sphenophylloides (Zenk.) Gutb, **30-32**, 35, 111, 116
  spinulosa Sternb, 25
  stellata (Schloth.) Wood, **25–30**, 32, 34, 111, 116
  westphalica Stur, 26, 28
Antholithus L. and H, 106, 108
Aphlebiæ, 63
Aphlebia Presl, **101**, **103**
  arborescens (Lx.), **102–103**, 115, 116
  elongata Zeill, 103
  filiciformis (Gutb.) Zeill, 102, 103
Apparinæ densius foliatæ Luidius, 25
Araucarites Goepp, 108
Archæocalamites Stur, 19, 36
Arkansas, extent of work done on coal flora in, 119
Artisia, 108
Aspidites macilentus (L. and H.) Goepp, 55
Asterocalamites Schimper, 19
Asterophyllites Brongn, 43
  equisetiformis (Schloth.) Brongn, 26
  foliosus Lebour, 24
  Jackson, 26
  longifolius (Sternb.) Binney, 26
  (?) Morton, 26
  tuberculata (Sternb.) Brongn, 26
  westphalicus Stur, 26, 28
  relations to sphenophyllum, 35
Aurora, occurrence of plants at, 12

B.

Page.

Bay State lease, occurrence of plants at, 12
Belleville, occurrence of plants at, 11
Bornia Sternb, 19, 25, 35
  stellata Sternb, 25
Bristow land, occurrence of plants on, 12
Britts, J. H., acknowledgments to, 16
  collection of plants from Clinton, Mo., 118
Bruckmannia tuberculata Sternb, 26, 28, 30
Burlington limestone, relations of to outlying coal basins, 12

C.

Calamariæ, **17–43**, 35
Calamites Suckow, **17–25**
  nodosus Schloth, 17, 24
  ramifer Stur, 20, 24, 25, **32**, 35
  ramosus Artis, **17–25**, 32, 111, 116
  Suckowii Brongn, 22, 24, 25
  undulatus Sternb, 25
  (Eucalamites) ramosus Artis, **17–25**
  (Stylocalamites) Suckowii Brongn, 20
Calamitina Weiss, 19. 36
Calamostachys calathifera Weiss, 31
  ramosa Weiss, 17-24
  tuberculata (Sternb.) Weiss, 26
Calloway County, Mo., carboniferous outliers in, 12
Cardiocarpon Brongn. (*See* Cardiocarpus.)
Cardiocarpum. (*See* Cardiocarpus.)
Cardiocarpus Brongn, 108
  australe Carr, 108
  Baileyi Dawson, 108
  cornutum Dawson, 107
  emarginatum Brongn, 108, 109
  Gutbieri Gein, 107
  Harveyi Lx, 108
  ingens Lx, 108
  latum Newb, 107, 108. 109
  Ottonis Gutb, 107, 109
  pachytesta Lx, 107, 109
  samaræforme Newb, 108
  zonulatus Lx, 107, 109
Casuarinites stellatus Schloth, 25
Cheilanthites irregularis (Sternb.) Goepp, 52, 53
  obtusilobus (Brongn.) Goepp, 52
Chouteau limestone, 12
Cole county, Mo., Carboniferous outliers in, 12
Cordaianthus Gr. 'E, **106–107**
  species, **106–107**

Page.
Cordaianthus baccifer Gr. 'E 106
 subgermarianus Gr. 'E.................. 106
Cordaicarpus Gr. 'E 107-109
 acuminatus R. and Z..................... 108
 congruens Gr. 'E......................... 107
 lineatus Lx...................107-109, 115, 116
 major...............................107, 109
 minor Brongn 108
 ovatus 107
 sclerotesta Brongn...................... 108
Cordaicladus Gr. 'E......................... 108
 selenoides Gr. 'E........................ 106
Cordaioxylon Gr. 'E 108
Cordaispermum Gr. 'E........................ 108
Cordaistrobus Lx 108
Cordaiteæ 105-109
Cordaites Ung 105-107
 borassifolius (Sternb.) Ung 105
 cf. costatus Lx 106, 115
 communis Lx 105-106, 115, 116
 costatus Lx............................. 106
 principalis (Germ.) Goepp 105
 serpens Lx.............................. 106
Correlations of different organs of fossil plants 18
Cyatheites dentatus (Brongn.) Goepp...... 60
 plumosus (Artis?) Goepp................. 61
Cyathocarpus dentatus (Brongn.) Weiss... 61
Cycadaceæ................................... 108
Cyclocarpus, Goepp. and Fiedl............ 108
Cyclopteris crassinervis Goepp 98
 dentata R. and Z........................ 98
 dilatata L. and H.................... 96, 97
 fimbriata Lx............................ 68
 lacerata Heer........................... 68
 oblata L and H 97
 orbicularis Brongn................... 97, 98
 semiflabelliformis Morris............... 98
 trichomanoides 97, 98
 valida Dawson........................... 56
 Wilsoni Wood............................ 68
Cyperites bicarinata L. and H 104

D.

Dactylotheca dentata (Brongn.) Zeill 61
 plumosa (Artis?) Kidst 61
 plumosa var. dentata Kidst 61
Dadoxylon Endl 108
Dictyo-Cordaites Dawson.................... 108
Dictyopteris Gutb 99-101
 Brongniartii Gutb 100, 101
 cordata (Brongn.) Roem 78
 obliqua Bunb 101
 neuropteroides Gutb................... 100, 101
 Scheuchzeri (Hoffm.) Roem............ 78, 101
 Schützei Stur 101
 squarrosa (Ett.) sp................99-101, 115
Diplazites longifolius (Brongn.) Goepp..... 64
Diplothmema Stur 43, 44-46, 55, 56, 59
 furcatum (Brongn.) Stur.............45, 46, 59
 geniculatum (Germ. & Kaulf.) Stur 44, 46, 59, 112, 126
 irregulare (Sternb.) Stur 53
 Jacquoti, Zeill.......................... 51
 lobatum (Gutb.) Stur..................... 55
Diplothmema macilentum (L. and H.) Stu
 obtusilobum (Brongn.) Stur.........
 subgeniculatum Stur ....
 (Hymenophyllites) Hildreti (Lx.) Stu
 (Sphenopteris) irregulare (Sternb.) S
 (Sphenopteris) obtusilobum (Brong
 Stur ....
Diplothmemæ..............................
Dory-Cordaites Gr.' E.....................

E.

Equisetineæ ....
Equisetites lingulatus Germ...............
Equisetum Parkinson ....
 stellifolium Harlan.................
Eucalamites Weiss ....
 (calamites) ramosus (Art.) Kidst ...
 ramosus.............................

F.

Filicineæ.................................
Filicites ....
 plumosus Artis......................
 tennifolius Schloth ....
Flabellaria Sternbergii Ett ....
Fucoides, Gutb ....

G.

Galium album latifolium Rupp ....
 album vulgare Tourn ....
 sphenophylloides Zenk ....
Geographical distribution of species .....
Geological relations of flora ....
Georgia, extent of work done on coal flora
Gleichenia gigantea Wall..................
Grand' Eury, researches in French coal fie
Gymnospermæ...............................

H.

Hannam's shaft, occurrence of plants at
Hapalopteris Stur ....
 (Sphenopteris) rotundifolia (And
 Stur.............................
Hemitelia capensis Br.....................
Heteropteris Brongn ....
Hydatica Artis............................
Hymenophyllites Goepp ....
 arborescens Lx......................
 Hildreti Lx ....
Hymenophyllum ....

I.

Illinois, extent of work done on coal pla
 of ....
Indian Territory, ignorance of paleontolo
 of ....
Indiana, work done on Carboniferous pla
 of ....
Iowa, condition of Paleozoic paleobotany

J.

Jenney, W. P., investigations of lead a
 zinc deposits by ....
 plants collected by...................
Joplin, Mo., occurrence of fossil plants n
Jordania Goepp. & Fiedl ....

K.

Page.

done on Carboniferous
.... 119
ce of Pothocites Grantoni
.... 19

L.

nowledgments to........ 16
f plants from Campbell's
.... 118
f stems of Annularia stell-
.... 27
.... 101
on lead and zinc deposits
ri........ 12
.... 35
Brongn........ 104
description of stem-bases
ites ramosus........ 20
erican Paleozoic flora..... 16, 67
Mo., Carboniferous out-
ins in........ 12
nacrolepidotum Gold...... 104
easures, extent of knowl-
ossil plants of........ 119
rous, relations to carbon-
tliers........ 14
ures, extent of knowledge
plants of........ 119
.... 35
........108, 104, 120

M.

ft, Belleville, Mo., descrip-
........11, 12, 13
chimp........ 36
collections of plants from
n........ 118
l........46–52, 55
gn........ 47
ongn.) Zeill........ 49, 51
.... 52
sp........47. 49, 52
pteris) decipiens (Lx.) 47–52,
112. 116, 126, 128
Lx.)........46–47, 112, 116
ed in Carboniferous basins. 14
of knowledge of coal flora
.... 119
nty, Mo., outlying coal
f........ 12

N.

atata (L. and H.), Schimp 96
........68–101
ngn........ 68–99
ongn 70, 71, 72, 74, 75, 77, 80
Brongn........69, 70,
71, 72, 73, 74, 75, 76, 77, 79, 80
ta Lx........ 70, 77
.... 90
rongn........ 84
.... 93
f........87–91, 114, 132
oides (Brongn) Lx .95–96, 115, 132

Page.

Neuropteris Clarksonii Lx........79, 81, 84
 Collinsii Lx........ 80
 cordata Brongn........69, 71–77,
80, 81, 84, 100
  var. angustifolia Bunb........ 69
 coriacea Lx........ 86, 87
 decipiens Lx........72, 73, 75, 76, 77, 80, 81, 84
 dentata Lx........ 69
 Desorii Lx........ 86, 87
 dilatata (L. and H.) Lx........96–98, 115, 116
 fasiculata Lx........79, 80, 81
 fimbriata Lx........68–69, 113, 116
 flexuosa Sternb........69, 74,
91–93, 95, 114, 115, 116, 134
 fructification........ 93
 gigantea Sternb........ 93, 95
 hirsuta Lx........69, 70,
72, 73, 74, 75, 76, 77, 79, 80, 81, 84
 heterophylla Brongn........68, 86,
87, 88, 90, 92, 93, 95, 96, 97
 Jenneyi D. W........82–84, 88, 114, 128, 130
 laciniata Lx........ 69
 Loberti Heer........ 89, 90
 Loshii Brongn........88, 89, 90, 93, 96, 114
 macrophylla Brongn........79, 100
 missouriensis Lx........ 92, 95
 plicata Sternb........ 93
 rarinervis Bunb........85, 87, 114, 116, 134
 Rogersii Kimball........ 70, 77
 Scheuchzeri Hoffm........69–81, 84, 114, 116
 Smithsii Lx........ 87
 species........98–99, 115, 134
 squarrosa Ett........99, 100
 tenuifolia (Schloth.) Sternb........92, 93,
94–95, 96, 114, 115, 116
 trichomanoides (Brongn.) Lx....95, 96, 99, 115
 vermicularis Lx........ 93
Nevropteris acutifolia Brongn........ 69
 angustifolia Brongn........ 69
 flexuosa Sternb........ 91
 heterophylla Brongn........ 85
 rarinervis Bunb........ 85
 Scheuchzeri Hoffm........ 69
 tenuifolia (Schloth.) Sternb........ 94
Newberry, J. S., theory of filiform leaves
of sphenophyllum........ 39

O.

Odontopteris alata Lx........ 98
 lingulata Goepp........ 84
 minor Brongn........ 96
 neuropteroides Newb........ 89, 91
 obtusiloba Naum........ 83, 84
 Reichiana Gutb........ 96
 Wortheni Lx........84, 114
Oligocarpia Goepp........ 57
Ozark uplift, relations of, to coal formation 11

P.

Pachyphyllum Lx........101, 102
Paleobotanical sections, lack of.......109, 110, 118
Paleobotany, method of........ 110
 stratigraphic........110, 118
Paleontological........ 15
Palmacites Brongn........ 101

Page.
Pecopterideæ 60-67
Pecopteris Brongn 60-67
  abbreviata Brongn 101
  acuta Brongn 62, 63
  arborescens (Schloth.) Brongn ... 65, 66, 67, 113
  aspera Brongn 64
  aspidioides Brongn 65, 67, 113
  Biotii Brongn 101
  Brongniartiana Presl 61
  Candolliana Brongn 66, 67
  cyathea Brongn 66, 67, 113
  dentata Brongn 60-63, 101, 113, 116
  dentata var. delicatula Zeiller 63
  delicatula Brongn 62
  emarginata Presl 65
  hemitelioides Brongn 66, 67
  incompleta Lx 51
  lepidorachis Brongn 66, 67
  longifolia Brongn 65
  Monyi Zeill 66, 67
  paleacea Zeill 66
  pennæformis Brongn 62, 63
  platyrachis Brongn 66
  plumosa Artis 60
  plumosa (Artis?) Brongn 60, 62, 63
  triangularis Brongn 60
  unita Brongn 64, 113, 116
  venulosa Lx 66, 67
  (Aspidites) silesiaca Goeph 63
  (Asterotheca) Lesquereuxii D. W 65-67, 113, 128
  (Cyatheites) dentata Brongn 61
  (Dactylotheca) dentata (Brongn) Zeill 61
  (Ptychocarpus) unita Brongn 64, 65
Pennsylvania, extent of knowledge of paleozoic plants of 119
Permo-Carboniferous, present knowledge of fossil flora of 119
Phanerogams 105-109
Phytolithus stellatus Martin 25, 30
Pinnularia L. & H. 43
  species 43, 112
  capillacea L. & H 43
  fucoides Lx 43
  horizontalis Lx 43
  pinnata Lx 43
Plants as a means of limiting time of ore formation 13
  matrix of 11, 14
  mode of occurrence of 12
  circumstances of deposition of 13, 14
  value and relation of study to geology 15
  use of high differentiation of species 15
  progress of knowledge of Paleozoic in recent years 18
Poa-Cordaites Gr.' E 108
Pothocites Grantoni Patterson 19
Pseudopecopteris Lx 46, 55, 56
  anceps Lx 50
  cordato-ovata (Weiss) Lx 50, 51
  decipiens Lx 47, 50, 51
  irregularis. (Sternb) Lx 53, 54
  macilenta (L. & H.) Lx 55
  mazoniana Lx 46
Pseudopecopteris nummularia (Gutb.)
  obtusiloba (Brongn.) Lx ....
  relations to Mariopteris and Dip
    mema ....
  (Sphenopteris) macilenta (L. & H.)
Pyncnophyllum Brongn ....

R.

Renault, on fruit of Annularia ....
  study of paleozoic plants by ....
Renaultia Zeill ....
Rhacophyllum Schimp ....
  arborescens (Lx.) Schimp ....
Rhizocarpeæ ....
Rhodea ....
Rotularia asplenioides Sternb ....
  cuneifolia Sternb ....
  erosa (L. & H.) Goepp ....
  major Bronn ....
  polyphylla Sternb ....
  pusilla Sternb ....
Rubeola mineralis Luidius ....
Rubia sylvestris Volk ....

S.

Schizopteris Presl ....
Schmidt, Adolf, and Leonhard, repor
  lead and zinc deposits of Miss
Scuto-Cordaites R. and Z ....
Senftenbergia acuta (Brongn.) Stur ....
  dentata (Brongn.), Stur ....
  plumosa (Artis) Stur ....
Sigillaria Brongn ....
  leaves of ....
  species 1
Sigillariæ 3
Sinks in zinc region ....
Sphenophyllum Brongn ....
  bifurcatum Lx ....
  cuneifolium (Sternb.) Zeill .. 36-40,
  var. saxifragæfolium Zeill ....
  dentatum Brongn ....
  dichotomum Germ. & Kaulf ....
  emarginatum Brongn ....
  erosum L. & H ....
    var. Saxifragæfolium Schimp ....
  fimbriatum Brongn ....
  latifolium F. & W ....
  latifolium R. and Z ....
  latifolium Wood ....
  longifolium (Germ.) Gein. & Gutb.
  majus Bronn 40-
  multifidum Sauveur ....
  oblongifolium Germ ....
  saxifragæfolium (Sternb.) Goepp ..
  Schlotheimii Brongn ....
    var. dentatum Ett ....
  erosum Ett ....
    var. saxifragæfolium Ett ....
  trifoliatum, Lx ....
Sphenopterideæ ....
Sphenopteris Brongn ....
  adiantoides L. and H ....
  bifida L. and H ....
  Böckingiana Weiss ....

Page.
audata L. and H............ 60
Roehl........................ 51
& H.......................... 101
Lx.......................... 47, 50
x.......................... 47, 50, 52
Germ. and Kaulf............ 44
ongn........................ 58
x............................ 46
x................ 46, 58–60, 113, 116
Sternb...................... 52, 53
W.............. 56–58, 113, 116, 128
Brongn...................... 46, 59
and H........................ 52
Andrä........................ 58
xii Newb.................... 50
tb............................ 55
L. and H.................... 55
Dn............................ 58
ia Gutb.................. 57, 58, 113
Brongn................ 53, 54, 57, 58
Goepp........................ 58
.... 59, 113, 126
Gutb.......................... 58
a Dn.......................... 59
oides Brongn................ 59
(Art.?) Brongn..... 52, 5354, 56, 58
des) decipiens Lx............ 47
Lx. & H...................... 55
Brongn........................ 52
grammides) irregularis
.... 53
hyllites) Hildreti Lx........ 58
copteris) macilenta (L. & H.)
....................55, 56, 113, 116, 126
copteris) obtusiloba (Brongn.)
.....................52, 54, 56, 112, 116
nites) Kaulfussii (Goepp.)
p................................ 44
a calathifera, Weiss..........31, 34
a (Sternb.) Weiss............ 26
.... 108

Page.
Stratigraphical relations of the fossil plants. 11
Stur, work on European material.......... 18
Stylocalamites Weiss...................... 19, 25

T.

Table of distribution of species............ 116
Texas, extent of work done on Paleozoic plants of............ 119
Topography of zinc region and relation to outliers.................. 13, 14
Trichomanites Kaulfussii Goepp........... 44
Trichomanites Goepp...................... 101

U.

Upper Coal-measures, extent of knowledge of fossil plants of.................. 119

V.

Vascular cryptogams.......................17–104
Volkmannia................................ 36
    pseudosessilis Gr.'E.................. 32

W.

Ward, Lester F., letter of transmittal...... 9
Warren county, Mo., outlying carboniferous basins of...................... 12
Weiss, classification of Calamites.......... 19
    work on German collections.......... 18
West Virginia, extent of knowledge of Paleozoic flora of...................... 119
Winslow, description of Carboniferous river.................................. 14

Z.

Zeiller, on fructification of Sphenophyllum cuneifolium...................... 40
    on paleobotany of French coal-measures 18
    paleontological method used by........ 15
Zeilleria delicatula (Sternb.) Kidst......... 46
Zinc and lead deposits, occurrence and relations of plants to.................. 14

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UNITED STATES GEOLOGICAL SURVEY

J. W. POWELL, DIRECTOR.

RECORD

OF

NORTH AMERICAN GEOLOGY FOR 1891

BY

NELSON HORATIO DARTON

WASHINGTON
GOVERNMENT PRINTING OFFICE
1892

ECORD OF NORTH AMERICAN GEOLOGY FOR 1891.

By Nelson Horatio Darton.

INTRODUCTORY.

vork is the continuation of the record for 1890,[1] and com- ublications received during the year 1891.

iterary scope of this record includes geologic publications in North America, and publications on North American wherever printed. Purely paleontologic or mineralogic re omitted.

ntries are comprised in the two following classes, all arranged gle alphabetic sequence:

ncipal entries.—Consisting of full titles of separate contribu- ıssified by authors, together with an abbreviated reference ontaining publication and a short note descriptive of the contents. Imprint dates are given only when other than l size of page when other than octavo. The extent of papers n a page in length is indicated thus: ⅛ p., ¼ col., 3 lines.

bject references.—Each consisting of a condensed title of ıd the author's name for cross-reference to a principal entry. e essentially index references, but they are entered under l number of headings, of which a classified key is given on page.

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[1] Bulletin U. S. Geological Survey, No. 91. Washington, 1891.

CLASSIFIED KEY TO THE SUBJECT ENTRIES.

(1) GEOGRAPHIC SUBJECTS.

Alabama.
Alaska.
Arizona.
Arkansas.
Asia.
Australia.
California.
Canada (including all of British America).
Central America.
Colorado.
Connecticut.
Dakotas.
Delaware.
East Indies.
Europe.
Florida.
Georgia.
Hawaiian Islands.
Idaho.
Illinois.
Indiana.
Indian Territory (and "Public land strip").
Iowa.
Kansas.
Kentucky.
Louisiana.
Maine.
Maryland (including District of Columbia).
Massachusetts.
Mexico.
Michigan.
Minnesota.
Mississippi.
Missouri.
Montana.
Nebraska.
Nevada.

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(2) STRATIGRAPHIC SUBJECTS.

nd Algonkian, with sub-headings as follows:
rn Canada.
Superior to Lake Huron region and western Canada.
sippi river to Rocky mountains.
England.
York to Georgia.
of the Rocky mountains.
nclature.

, with sub-headings as follows:
achian (Vermont to Alabama).
la.
is.
Superior region.
of the Mississippi river.
al and nomenclature.

rous (including Permian), with sub-headings as follows:
achians to Mississippi river.
a.
sippi river to Rocky mountains.
mountains to Pacific coast.
nia to Alabama.
al and nomenclature.

Cretaceous, with sub-headings as follows:
- Atlantic coast region.
- Canada.
- Illinois.
- Kentucky.
- Mexico.
- Mississippi river to Rocky mountains.
- Pacific coast region.
- Nomenclature.

Devonian, with sub-headings as follows:
- Appalachians (New York to Alabama).
- Appalachians to Mississippi river.
- Canada.
- West of the Mississippi river.
- General and nomenclature.

Jura-Trias, with sub-headings as follows:
- Mississippi river to Rocky mountains.
- Newark formation (Nova Scotia to Virginia).
- West of the Rocky mountains.
- West Canada.
- General and nomenclature.

Pleistocene, with sub-headings as follows:
- Alaska.
- Appalachians to Mississippi basin.
- Atlantic coast region.
- Central America.
- General.
- Great lakes region and Eastern Canada.
- Mississippi basin to Rocky mountains.
- Rocky mountains to Pacific coast.
- Western Canada.

Silurian, with sub-headings as follows:
- Appalachians (Vermont to Alabama).
- Appalachians to Mississippi river.
- Canada.
- West of Mississippi river.
- Nomenclature.

Tertiary, with sub-headings as follows:
- Alaska.
- Atlantic coastal plain.
- Canada.
- Gulf states (Florida to Texas, and Arkansas).
- Illinois.
- Kentucky.

ssippi river to Rocky mountains (north of Arkansas).
c coast region.
essee.
ral and nomenclature.

(3) OTHER SUBJECTS.

philosophy, with sub-headings as follows:
mation.
logy.
ology.
eposits.
ographic geology.
llaneous.
phy.

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South trap range of Keweenawan series, WADSWORTH.
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Eastern equivalents of Minnesota iron ores, WINCHELL, N. H.
Iron ores of Minnesota, WINCHELL, N. H. and H. V.
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American opinion on the older rocks, WINCHELL, A.
Marquette and Keweenaw district, WADSWORTH.
Record of field observation, WINCHELL, A.

d Algonkian—Continued.
e of Selkirk range, DAWSON,
WALCOTT.
innipegosis and Porcupine
ains, TYRRELL.
river to Rocky mountains.
l mineral region, COMSTOCK.
f state geologist, DUMBLE.
ntral Texas, COMSTOCK.
geology of the Southwest,

basin of Texas, CURTICE.
Rocky mountain division, U.
. Survey, EMMONS.
and diaspore from Rosita
Colorado, CROSS.
enomena, Boulder county,
do, FARISH.
issance in Indian Territory,

Montana division, U. S. Geol.
, PEALE.
ne rocks of Missouri, HA-
.
Lake Superior division, U. S.
Survey [rocks of Missouri],
ISE.
se deposits, PENROSE.
nd. Report, division of Ar-
Geology, U. S. Geol. Survey,
LLY.
n opinion on the older rocks,
ELL, A.
n granite [Cape Ann], TARR.
Lower Cambrian, WALCOTT.
beds in central Massachu-
EMERSON.
nyre from Marblehead Neck,
chusetts, analysis, CHATARD.
Massachusetts, EMERSON.
Rocks about New Haven,

phism in conglomerate
WOLFF.
of Minnesota, WINCHELL, N.
H. V.
to Georgia. New Jersey,
urvey, Report [Age of white
ones], AM. GEOLOGIST. DANA.
. SMOCK.
hæan age of white lime-
, NASON.
wells in eastern Pennsylva-
RTER.
n opinion on the older rocks,
ELL, A.

Archean and Algonkian—Continued.

Feldspar bed in Pennsylvania, CARTER.

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Nomenclature. American opinion on the older rocks, WINCHELL, A.

A last word with the Huronian, WINCHELL, A.

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Lake Superior stratigraphy, LAWSON, VAN HISE.

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Devonian and Carboniferous, correlation, Williams, H. S.
Fauna of Lower Cambrian, Walcott.
Manganese deposits, Penrose.
Meteoric iron locality, Foote.
Stones for building, Merrill, G. P.

Arkansas. Appomattox formation, McGee.
Bauxite, Branner.
Basic dikes outside of syenite areas, Kemp.
Comanche series of Texas—Arkansas series, Hill.
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Arkansas—Continued.
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Modoc county, PRESTON.
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Stones for building, MERRI

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Auriferous series of Nova
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UPHAM.
A last word with the H
WINCHELL, A.
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Beach phenomena at Qua
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COTT.
Carboniferous fossils from Ne
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Scotia, GILPIN.
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MATTHEW.
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valley, BRAINERD.
Chemical contributions, HOF
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LAWSON.
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MCCONNELL.
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America, WHITE, C. A.
Criteria of englacial and su
drift, UPHAM.
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C. A.
Davis on the Iroquois beach, S
Devonian of Cape Breton, G
Deformation of the Algonqui
SPENCER.
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relation, WILLIAMS, H. S.
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Oregon, BECKER.
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Facts noted on Grand river,
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remains, New Brunswick,
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RCOU.
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WARDS.
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Superior stratigraphy, LAW-
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channel of Niagara river, SCO-
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graphic differentiation in dikes
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Map of Kentucky, PROCTER.

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central Kansas, **Ladd.**
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Igneous rocks, Arkansas, **Wi**
J. F.
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Streeruwitz.
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Central mineral region of
Comstock.
Central basin of Texas, **Curt**

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lachians, **Hayes.**
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Iron ores of Virginia, **Pechin.**
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Nicaragua, CRAWFORD.
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—— and **SALISBURY**, R. D. On the relationship of the Pleistocene to the pre-Pleistocene formations of the Mississippi basin south of the limits of glaciation.

Am. Jour. Sci., 3d series, vol. 41, pp. 359–377. Also in part in **Arkansas Geol. Survey**, Report for 1889, vol. 2. The Geology of Crowley's ridge, by R. E. Call, pp. 224–248.

Discussion of the relations of the glacial drift, loess and orange sand formations and their bearing on the geologic history of the region.

CHANCE, H. M. The resources of the Black hills and Big Horn country, Wyoming.

Am. Inst. Mining Engineers, Trans., vol. 19, pp. 49–58.

Includes brief general references to geology of the region.

CHAPIN, J. H. Some geological features of Meriden.

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Includes brief references to certain fragmental eruptive materials in the Newark formation, to disturbed beds of clay and sand, and an eskar.

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Kansas Acad. Science, Trans., vol. 12, p. 74, ⅔ p.

Includes an account of the formation in which they occur.

CHATARD, T. M. Keratophyre from Marblehead Neck, Massachusetts. [Analyses.]

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—— Eruptive rock from Montana. [Analysis.]

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Sandstone dike series collected by J. S. Diller.

—— Sandstone from Arizona. [Analysis.]

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CHESTER, Frederick D. The gabbros and associated rocks in Delaware.

Am. Naturalist, vol. 25, p. 1002.

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CLARK, Ellis. Notes on the progress of mining in China.

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Includes incidental geologic notes.

CLARK, L. J. The formation of Toronto island.

Canadian Inst., Trans., vol. 1, pp. 37–38, 239–246.

Abstract, **Am. Naturalist**, vol. 25, pp. 821–822, 5 lines.

Discussion of its history, origin of its materials and conditions of deposition.

CLARK, William B. Report of the scientific expedition into southern Maryland. Geology.

Johns Hopkins Univ., Circulars, vol. 10, pp. 106–108, No. 89, 4°.

Geologic notes on exposures at Plum point, Cove point, Jones' wharf, Cornfield harbor, Nomini bluffs (Virginia), Pope's creek, Aquia creek (Virginia), and Fort Washington, with a general section of the coastal plain.

CLARKE, F. W. The relative abundance of the chemical elements.

U. S. Geol. Survey, Bull., No. 78, pp. 34–42.

Includes rock analyses.

CLARKE, J. M. The fauna, with *Goniatites intumescens*, BEYRICH, in western New York.

Am. Geologist, vol. 8, pp. 86–105.

Neues Jahrbuch, 1891, vol. 1, pp. 161–168.

Includes a brief description of the stratigraphic relations.

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Geol. Soc. Am., Bull., vol. 2, pp. 10–16.

A review of the "stability of continents" question.

—— Megalonyx in Holmes county, Ohio, 1890. Part 2.

Am. Geologist, vol. 7, pp. 149–153.

Includes a discussion of the age and history of the containing deposit.

—— An episode in the Paleozoic history of Pennsylvania.

Am. Geologist, vol. 8, pp. 152–159.

A sketch of the stratigraphy, fauna, and history of the Hamilton group in Pennsylvania.

—— On a deep boring near Akron, Ohio, and its significance,

Am. Geologist, vol 8, p. 239, ½ p.

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Canada, Royal Soc., Trans., vol. 8, section 3, pp. 11–18.

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COPE, E. D. The vertebrata of the Tertiary and Cretaceous rocks of the Northwest Territory. Canada, Geol. Survey, Contributions to Canadian Paleontology. The species from the Oligocene or lower Miocene beds of the Cypress hills, 25 pages, 15 plates, 4°. Montreal.

With a brief prefatory comment on the age of the beds.

—— On some new fishes from South Dakota.

Am. Naturalist, vol. 25, pp. 654–658.

Descriptions, followed by brief discussion of the age of the containing beds.

COX, E. T. Floridite: A new variety of phosphate of lime.

Am. Assoc. Adv. Science, Proc., vol. 39, pp. 260–262.

Occurrence, nature, and origin.

—— Florida pebble and nodular phosphate of lime.

Engineering and Mining Jour., vol. 52, pp. 359–360.

Read to Am. Assoc. Adv. Science, August, 1891. A general account of its distribution, stratigraphic relations, and constitution. Includes a letter by Henry Wurtz concerning the mineral nature, origin, and agricultural value of the Florida phosphates.

CRAGIN, F. W. On the Cheyenne sandstone and the Neocomian shales of Kansas.

Am. Geologist, vol. 7, pp. 23–33.

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—— On a leaf-bearing terrane in the Loup fork. [Near Alpine in the "Public Lands."]

Am. Geologist, vol. 8, pp. 29–32.

Description of the beds and their stratigraphic relations.

—— Further notes on the Cheyenne sandstone and Neocomian shales.

Am. Geologist, vol. 7, pp. 179–181.

Discussion of their identity and stratigraphic relations in the Kansas-Texas region.

CRAMER, Frank. On the rock-fractures at the Combined Locks Mill, Appleton, Wisconsin.

Am. Jour. Sci., 3d series, vol. 41, pp. 432–434.

Description of the fracture at the mill and of other similar fractures in the same region, and discussion of their cause.

CRAWFORD, J. Recent earthquakes in Nicaragua.

CRAWFORD, J.—Continued.

Am. Geologist, vol. 7, pp. 77–86, pl. 2.

Includes a brief account of the geology of the Granada region.

—— Neolithic man in Nicaragua.

Am. Geologist, vol. 8, pp. 160–166.

Describes the relations and characters of the stratum containing footprints, and discusses its age and history.

—— Viejo range of Nicaragua.

Am. Geologist, vol. 8, p. 190, ½ p.

Calls attention to extensive recent deposits of carbonate of lime from springs at the base of the Viejo range.

—— Evidences of a glacial epoch in Nicaragua.

Am. Geologist, vol. 8, pp. 306–314.

Account of striated surfaces and bowlder deposits and discussion of evidence of post-Pliocene elevation and subsidence of the region.

—— Human footprints in recent volcanic mud in Nicaragua.

British Assoc. Adv. Science, Report of 60th meeting, p. 812, ½ p.

Account of relations, and history of the formation in which the footprints are contained.

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An enumeration of the general geologic features.

CRESSON, Hilborne T. A fallen forest and peat layer underlying aqueous deposits in Delaware.

Geol. Soc. Am., Bull., vol. 2, pp. 640–642.

Sketch of the geology of the lower Delaware valley, and an account of relations of the forest and peat layer, and discussion of their age.

Cretaceous. *Atlantic Coast Region.* Cretaceous formations of North America, WHITE, C. A.
Date of origin of topographic forms, DAVIS.
Physical geography of southern New England, DAVIS.
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UHLER.
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Cahaba coal field region
CALLEY. SQUIRE. SM
Potomac formations of N
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LANGDON.
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SPENCER.
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DAWSON, G. M.
Later physiographic g
Rocky mountain region
G. M.
Northern extension of e
taceous, DAWSON, G. M.
Country north of Lesser
MCCONNELL.
Foraminifera and radio
Manitoba, TYRRELL.
Lake Winnipegosis and
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America, WHITE, C. A.
Glacial Lake Agassiz, UP
Illinois. Drift deposits, Wo
Kentucky. Map. PROCTOR.
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HILPRIN.
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Mississippi river to Rocky
Comanche series of Te
sas region, HILL.
Extension of Cretaceous o
basin of Texas, WALCOT
Southern interior of North
WHITE, C. A.
Trans-Pecos Texas, STREE
Cretaceous [of Trans-Pec
TAFF.
Cretaceous formations
America, WHITE, C. A.
Igneous rocks of Arkan
LIAMS, J. F.
Western Arkansas, WINSL

–Continued.
geology of New Mexico and
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OCK.
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ills and Big Horn country,
E.
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oil fields, Colorado, ELD-

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, HAUSMANN.
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RRY.
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group, WHITE, C. A.
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Cascade division, U. S.
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HOBSON.
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R.
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CROSBY, W. O. Composition of till or bowlder clay.

Boston Soc. Nat. Hist., Proc., vol. 25, pp. 115–140.

Abstract, **Am. Jour. Sci.,** 3d series, vol. 42, p. 259, ½ p.

Account of analyses of specimens from Boston basin region, of the nature of the separated materials and of the occurrence of salt in the drift. Discusses the history and relations of the tills, conditions of glacial erosion and transportation in the region, and the distribution of glacial and nonglacial silts.

—— On the contrast in color of the soils of high and low latitudes.

Am. Geologist, vol. 8, pp. 72–82.

Technology Quart., vol. 4, pp. 36–45.

Considers the conditions of occurrence of the red soils of the southern states, reviews Russell's statements concerning them, and discusses the nature and origin of the color.

CROSS, C. Whitman. Constitution and origin of spherulites in acid eruptive rocks.

Washington, Phil. Soc., Bull., vol. 11, pp. 411–443, pls. 5, 6.

Review by Anon., **Am. Geologist,** vol. 8, pp. 387–392.

Description of spherulites from Colorado, discussion of mineralogic constituents of spherulites, and historical review of spherulite literature.

—— On alunite and diaspore from the Rosita hills, Colorado.

Am. Jour. Sci., 3d series, vol. 41, pp. 466–475.

Includes a geologic sketch of the region, description of the alunite rocks, and discussion of their origin.

CUMMINS, W. F. Report on the geology of northwestern Texas.

Texas, Geol. Survey, Second Annual Report, pp. 357–552, map.

Abstract **Am. Jour. Sci.,** 3d series, vol. 42, p. 430, ⅔ p.

Description of Carboniferous, Permian, Triassic, and Tertiary formations, review of the economic geology and agriculture, and descriptions of the

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several counties in which the larger coal seams occur. Accompanied by a map indicating the coal measure and Permian areas and the Cretaceous border.

CURTICE, Cooper. [Relations of Paleozoic and pre-Paleozoic rocks in the Central basin of Texas.]

Geol. Soc. Am., Bull. vol. 2, pp. 527–528.

CURTICE, Cooper—Continued.

In discussion of "the Comanche series of the Texas-Arkansas region," by R. T. Hill.

CUSHING, H. P. Notes on the Muir glacial region, Alaska, and its geology.

Am. Geologist, vol. 8, pp. 207–230, pls. 3, 4.

Description of the glaciers and their deposits, and discussion of the glacial history of the region and the erosive power of the Muir glacier.

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Glacial Lake Agassiz in Manitoba, UPHAM.

New fishes from South Dakota, COPE.

DALE, T. Nelson. The Greylock synclinorium.

Am. Geologist, vol. 8, pp. 1–7.

Abstract, **Am. Jour. Sci.,** 3d series, vol. 42 p. 347, ½ p.

A condensed description of the structure and stratigraphy of the Greylock region and a postulation of certain structural principles which are therein illustrated.

DALL, W. M. Elevation of America in the Cenozoic periods.

Geological Magazine, 3d decade, vol. 8 pp. 287–288.

American Naturalist, vol. 25, pp. 735–736.

Points out the bearing of evidence in the Panama and Florida regions in review of W. Upham.

—— On the age of the Peace creek beds, Florida.

Philadelphia, Acad. Sci., Proc., 1891, p. 120, ⅓ p.

Abstract, **Am. Geologist,** vol. 7, p. 382, 4 lines.

A statement of their stratigraphic relations and fauna.

DANA, James D. Some of the features of nonvolcanic igneous ejections, as illustrated in the four "Rocks" of the New Haven region,—West rock, Pine rock, Mill rock, and East rock.

Am. Jour. Sci., 3d series, vol. 42, pp. 79–110, pls. 2, 7.

Description of the relations of the traps and sandstones in the New Haven region, with a comment on their general bearing.

DANA, James D.—Continued.

—— On Percival's map of the trap belts of central Connecticut, with observations on the upturning or mountain-making disturbance of the formation.

Am. Jour. Sci., 3d series, vol. 42, pp. 439–447, pl. 16.

A sketch of some of the features of the area, illustrated by a reproduction of a part of Percival's map, and a discussion of the mechanism of the uplift.

—— Annual report of the State Geologist of New Jersey for the year 1890, 305 pp., 8°, 1891.

Am. Jour. Sci., 3d series, vol. 42, pp. 70–72.

A review of the contained report by F. L. Nason on the age of the crystalline limestones of Sussex county, New Jersey.

—— The four "rocks," with walks and drives about New Haven, 120 pages, 7 plates, New Haven

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DARTON, N. H. Mesozoic and Cenozoic formations of eastern Virginia and and Maryland.

Geol. Soc. Am., Bull., vol. 2, pp. 431–450, pl. 16.

Abstracts, **Am. Geologist,** vol. 8, p. 185, ½ p.; **Am. Naturalist,** vol. 25, p. 658, 4 lines.

Description of distribution, stratigraphy, characters, and structure of the formations of the middle Atlantic coastal plain, account of a displacement, and sketch of the geologic history of the region. Illustrated by a geologic map.

—— Geology of sedimentary rocks. Washington sheet, Maryland, District of Columbia, Virginia. U. S. Geological Survey.

Guide to Washington, prepared for the International Congress of Geologists, Fifth Session, Washington. In back. Folded, colored geologic map, with geology of crystalline rocks, by G. H. Williams.

—— Clastic formations of Washington.

Guide to Washington prepared for the International Congress of Geologists, Fifth Session, Washington, pp. 59–62.

Description of the general structure and of the Cretaceous, Tertiary, and Pleistocene formations.

DARTON, N. H.—Continued.

—— Record of North American geology for 1887 to 1889, inclusive.

U. S. Geol. Survey, Bulletin No. 75, 173 pages. Washington.

List of papers with descriptive notes and index references.

—— Record of North American geology for 1890.

U. S. Geol. Survey, Bulletin No. 91, 88 pages. Washington.

List of papers with descriptive notes and index references.

—— Notes on the geology of the Florida phosphates.

Am. Jour. Sci., 3d series, vol. 41, pp. 102–105.

Abstract, **Engineering and Mining Jour.,** vol. 51, p. 210, 1½ col. 4°.

Descriptions of the several classes of deposits, and discussion of their geologic relations and history.

—— Record of a deep well at Lake Worth, southern Florida.

Am. Jour. Sci., 3d series, vol. 41, pp. 105–106.

Brief notes on materials penetrated in a 1212-foot well, and statements in regard to the age and limits of the beds.

—— The relations of the traps of the Newark system in [the] New Jersey [region].

Am. Naturalist, vol. 25, p. 910, ⅓ p.

Abstract of paper described in Record for 1890.

—— On a jointed earth-auger for geological explorations in soft deposits.

Am. Geologist, vol 7, pp. 117–119.

Engineering and Mining Jour., vol. 51, p. 401, ½ col. 4°.

Abstract, **Geol Soc. Am., Bull.,** vol. 2, p. 638, 8 lines.

Instructions for its construction and use.

DAVIDSON, Walter B. M. Suggestions as to the origin and deposition of Florida phosphates.

Engineering and Mining Jour., vol. 51, pp. 628–629, 4°.

—— A phosphatic chalk at Taplow, England.

Engineering and Mining Jour., vol. 52, p. 502, ⅔ col. 4°.

Extracts from a paper with this title by M. A. Strahan, who holds that the phosphoric acid in the deposits was mainly derived from fishes. Suggests that the Florida phosphates were similarly derived.

DAVIS, William M. The geological dates of origin of certain topographic forms on the Atlantic slope of the United States.

Geol. Soc. Am., Bull., vol. 2, pp. 541–542, 545–586.

Abstract, **Am. Geologist,** vol. 8, p. 260, ¼ p.

DAVIS, William M.—Continued.

A preliminary analysis of the topographic development of the Atlantic slope, with a brief chapter on genetic topographic classification in general, and comments on the representation of dates of topographic forms by colored maps.

—— Introductory statement. Two belts of fossiliferous black shale in the Triassic formation in Connecticut.

Geol. Soc. Am., Bull., vol. 2, pp. 415–424, 430.

Abstracts, **Am. Geologist,** vol. 8, p. 118, ⅔ p.

Am. Jour. Sci., 3d series, vol. 42, pp. 72–73.

An account of the relations about Meriden, in which are discussed the origin of the deposits, formation of the trap sheets, deformation, topographic expression of structure, and the structure and stratigraphy in the Meriden region. Discussed by B. K. Emerson, p. 430.

—— [Age and extent of the overthrusts in the southern Appalachians.]

Geol. Soc. Am., Bull., vol. 2, pp. 153–154, ½ p.

Abstract, **Am. Geologist,** vol. 7, p. 262, ⅛ p.

In discussion of paper by C. W. Hayes "The overthrust faults of the southern Appalachians." Presentation of evidence correlating them with the post-Newark deformation and suggestion of means for determinining their original extent.

—— The physical geography of southern New England.

Johns Hopkins Univ., Circulars, vol. 10, No. 87, pp. 78–79, 3/16 p., 4°.

An analysis of the development of the topography of the region from the Cretaceous to the present time.

—— The Triassic sandstone of the Connecticut Valley.

Johns Hopkins Univ., Circulars, vol. 10, No. 87, p. 79, ½ col., 4°.

Description of a model illustrating the history of the region from the Triassic to the beginning of the Pleistocene.

—— The lost volcanoes of Connecticut.

Popular Science Monthly, vol. 40, pp. 221–235.

Account of relations and history of igneous members of the Newark formation in the Connecticut valley, and description of a model exhibiting the development of the structure of the region.

—— Was Lake Iroquois an arm of the sea?

Am. Geologist, vol. 7, pp. 139–140.

Reviewed by J. W. Spencer, ibid., pp. 266–267, ⅔ p.

Discussion of the conditions attending the presence of Lake Iroquois, especially in connection with its outlet.

—— Structure and origin of glacial sand plains.

Am. Geologist, vol. 7, p. 141, ¼ p.

Abstract of paper described in Record for 1890.

DAWSON, George M. On the later physiographical geology of the Rocky mountain region in Canada with spe-

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cial reference to changes in elevation and to the history of the glacial period; being the presidential address for the year.

Canada, Royal Soc., Trans., vol. 9, section 4, pp. 3-74. pls. 1-3.

Review of Mesozoic and Tertiary history and elaborate discussion of evidence bearing on the glacial history of the Rocky mountain and adjoining regions.

—— Report on a portion of the West Kootanie district, British Columbia.

Canada, Geol. Survey, Reports, vol. 4, new series, report B, 66 pages, map, plates, 1890.

Abstracts, ibid. report A, pp. 7-12; **Am. Geologist**, vol. 8, pp. 392-394.

Description of a crystalline rock series, in part Paleozoic, granites, ore deposits, principal physical features, glaciation and superficial deposits; detailed notes on mining districts and claims, and comments on glacial history of the region and genesis of the ore deposits. Accompanied by a map indicating geology along the routes traveled.

—— Note on the geological structure of the Selkirk range.

Geol. Soc. Am., Bull., vol. 2, pp. 165-176.

Abstracts, **Am. Geologist**, vol. 7, pp. 262-263, ½ p. **Am. Naturalist**, vol. 25, p. 658, 3 lines.

Description of the stratigraphy and structure, with introductory remarks on the general geology of the Canadian Rocky mountain and the interior plateau regions with comparative stratigraphic lists for each region. Discussed by C. D. Walcott, p. 611, ¼ p.

—— [Northern extension of earlier Cretaceous in western British North America.]

Geol. Soc. Am., Bull., vol. 2, p. 207, ¼ p.

In discussion of paper by G. F. Becker: "Notes on the early Cretaceous of California and Oregon." Refers to an occurrence of *aucella*-bearing beds in the far North and remarks on the designation of the earlier Cretaceous of the West.

—— [Remarks on glaciation of the Great Plains region.]

Geol. Soc. Am., Bull., vol. 2, pp. 275-276.

Abstract, **Am. Geologist**, vol. 7, p. 143, 5 lines.

Discussion of paper by W. Upham, "Glacial Lakes of Canada."

DAWSON, J. William. Carboniferous fossils from Newfoundland.

Geol. Soc. Am., Bull., vol. 2, pp. 529-540, pls. 21, 22.

Abstract, **Am. Geologist**, vol. 8, pp. 259-260, ¼ p.

Includes brief introductory note on the geology of the region and concluding remarks on the stratigraphy of the coal formation of Newfoundland.

—— On fossil plants from the Similkameen valley and other places in the southern interior of British Columbia.

DAWSON, J. William—Continued.

Canada, Royal Soc., Trans., vol. 9, section 4, pp. 75-91.

Including remarks on their age and geological bearing.

—— [The age of the Catskill flora.]

Am. Geologist, vol. 7, p. 363, ⅔ p.

Letter to C. S. Prosser included in paper "The Geological Position of the Catskill Group."

[DE GROOT, Henry.] The Searles borax marsh.

California, 10th Report of Mineralogist, pp. 534-539, 1890.

Includes a record of a boring down to 230 feet.

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Mesozoic and Cenozoic, Darton.
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DERBY, Orville A. On the occurrence of xenotime as an accessory element in rocks.

Am. Jour. Sci., 3d series, vol. 41, pp. 308-311.

Calls attention to its occurrence and associates in Brazil, and in granite from Westerly, Rhode Island.

—— On the magnetite ore districts of Jacupiranga and Ipanema, São Paulo, Brazil.

Am. Jour. Sci., 3d series, vol. 41, pp. 311-321.

Brief account of geology of the region and petrographic description of the rocks.

—— Nepheline-bearing rocks in Brazil. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 39, p. 263, ¼ p.

Notices of their nature and associates.

——Observations on the genesis of certain magnetites. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 39, p. 263, 4 lines.

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—— The Columbia formation in the Mississippi embayment. [Abstract.]

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Brief notice of its distribution, character, and thickness.

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—— Biographical notice of Ebenezer Emmons.

Am. Geologist, vol. 7, pp. 1-23, pl. 1.

Includes historical data concerning the Taconic system and a list of Emmons' publications. Accompanied by a portrait.

MARSH, O. C. Geological horizons as determined by vertebrate fossils.

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Maryland, including **District of Columbia**. Anglesite [etc.], Carroll county, WILLIAMS, G. H.
- Artesian wells, WOOLMAN.
- Cambrian of North America, WALCOTT.
- Cretaceous and Eocene, UHLER.
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- Sedimentary rocks of Washington, DARTON.
- Section across Piedmont plateau, KEYES.
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- Arkose beds in Newark in central Massachusetts, EMERSON.
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- Clay concretions, ARMS.
- Composition of till, CROSBY.
- Criteria of englacial and subglacial drift, UPHAM.

Massachusetts—Continued.
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- Equivalents of Minnesota iron ores, WINCHELL, N. H.
- Fauna of Lower Cambrian, WALCOTT.
- Fossiliferous shales in Trias of Connecticut, DAVIS.
- Fresh water swamps, SHALER.
- Greylock synclinorium, DALE.
- Genesis of iron ores, KIMBALL.
- Inequality of distribution of englacial drift, UPHAM.
- Iron ores of Minnesota, WINCHELL, N. H. and H. V.
- Kameridges, etc., in Hingham, BOUVÉ.
- Kerarophyre from Marblehead Neck [analysis], CHATARD.
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- Position of fossiliferous Newark beds. EMERSON.
- Preservation of glaciated rocks, FULLER.
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- Relation of secular rock disintegration of certain transitional schists, PUMPELLY.
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- Stones for building, MERRILL, G. P.
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- Walden, Cochituate, and other lakes enclosed by modified drift, UPHAM.
- What constitutes the Taconic mountains, WINCHELL, N. H.

MATTHEW, G. F. Illustrations of the fauna of the St. John group. No. V.

Canada, Royal Soc., Trans., vol. 9, section 4, pp. 123–166, pls. 9–16.

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—— [Fish remains in the Lower Helderberg of New Brunswick.]

Am. Geologist, vol. 8, pp. 61–62, ⅓ p.

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[**MAYNARD**, George W.] The ore deposits of Pioche, Nevada.

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MEZGER, A.—Continued.

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A resumé of the evidence in answer to J. D. Dana, **Am. Jour. Sci.,** 3d series, vol. 42, pp. 70–72.

—— Iron mines. Notes on the active iron mines.

New Jersey, Geol. Survey, Report for 1890, pp. 51–127.

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Basic dikes, KEMP.

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- Cambrian of North America, Walcott.
- Cretaceous of North America, White, C. A.
- Dates of origin of certain topographic forms, Davis.
- Extra-moramic drift phenomena, Salisbury.
- Eruptive iron ores, Nason.
- Fallen forest and peat layer in Delaware, Cresson.
- Geological Survey, Report. [Age of white limestone.] Am. Geologist. Dana. Nason.
- Geological work in southern part of the state, Coman.
- Iron mines, Nason.
- Post-archæan age of white limestones, Nason.
- Post-glacial history of the Hudson valley, Merrill, F. I. H.
- Report of State Geologist, Smock.
- Submarine channel of Hudson river, Lindenkohl.
- Stones for building, Merrill, G. P.

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- Notes on geology of the Southwest, Hill.
- Notes on northern and southwestern New Mexico, Hill.
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- Fire-clay beds of Staten island, Hollick.
- Genesis of iron ores, Kimball.
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Includes a detailed description of the geology of the Batesville manganese region and the deposits in southwestern Arkansas, accounts of the manganese deposits of the Appalachian region, Texas, the Rocky mountains, Nevada, California, and Canada, and a discussion of the origin and chemical relations of manganese deposits.

—— The origin of the manganese ores of northern Arkansas and its effect on the associated strata. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 39, pp. 250-252.

Includes an account of the extent of decomposition in the associated limestones and of the local deformation which has resulted.

Pennsylvania. American opinion on the older rocks, WINCHELL, A.

Artesian well at Parkesburg, LESLEY.

Pennsylvania—Continued.

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—— Deformation of the Algonquin beach and birth of Lake Huron.

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  - Silicified woods of eastern Arkansas, Call.
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Am. Geologist, vol. 8, pp. 19-28.

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—— Foraminifera and radiolaria from the Cretaceous of Manitoba.

Canada, Royal Soc., Trans., vol. 9, section 4, pp. 111-115.

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Maryland Acad. Sci., Trans., vol. 1, pp. 97-104, pl. A.

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Am. Jour. Sci., 3d series, vol. 41, pp. 33-52.

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Canada, Geol. Survey, Report, vol. 4, new series, Report E, 156 pages, 3 sheets in accompanying atlas, 1890.

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UPHAM, Warren—Continued.

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Geol. Soc. Am., Bull., vol. 2, pp. 243-274.

Abstracts, **Am. Geologist,** vol. 7, pp. 143, 375-377.

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—— Geographic limits of species of plants in the basin of the Red river of the North.

Boston Soc. Nat. Hist., Proc., vol. 25, pp. 140-172.

With remarks on the influence of climate in geologic times.

—— Walden, Cochituate, and other lakes enclosed by modified drift.

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Description of these lakes and of others in Massachusetts, Maine, New Hampshire, Rhode Island, and Minnesota, and discussion of their history and bearing on the origin of the osars and kames.

—— Elevation and subsidence during the glacial period.

Geol. Magazine, 3d decade, vol. 8, p. 92, ⅞ p.

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Geol. Magazine, 3d decade, vol. 8, pp. 330-331.

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—— Area and duration of Lake Agassiz.

Am. Geologist, vol. 8, pp. 127-128.

Review of Tyrrell on the extent of the lake in Canada.

—— [The altitude of the eastern and central portions of the United States during the glacial period.]

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Am. Geologist, vol. 8, pp. 233–234, ⅛ p.

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Am. Geologist, vol. 8, p. 238.

Discussion of paper by T. C. Chamberlin, "The present standing of the several hypotheses of the cause of the glacial period," read to Geol. Soc. America, 1891.

—— Origin and age of the Lafayette and Columbia formations.

Am. Geologist, vol. 8, p. 236, ⅓ p.

Discussion of paper by W. J. McGee, "Neocene and Pleistocene continent movements," read to Am. Assoc. Adv. Science, 1891.

—— Inequality of distribution of the englacial drift.

Am. Geologist, vol. 8, p. 239, ½ p.

Abstract of paper read to Geol. Soc. America, 1891.

—— Criteria of englacial and subglacial drift.

Am. Geologist. vol. 8. pp. 376–385.

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UPHAM, Warren—Continued.

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Appalachia, vol. 6, pp. 191–207.

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VAN HISE, C. R. An attempt to harmonize some apparently conflicting views of Lake Superior stratigraphy.

Am. Jour. Sci., 3d series, vol. 41, pp. 117–136.

Reviewed by A. C. Lawson, **Am. Geologist**, vol. 7, pp. 320–327, 388.

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WACHSMUTH, Charles, and **SPRINGER**, Frank. New species of crinoids and blastoids from the Kinderhook group of the lower Carboniferous rocks at Le Grand, Iowa.

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Notes on relation of traps, sandstones, and crystalline schists, and discussion of their bearing on the general relations of the traps to the eastern sandstones.

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——The eastern equivalents of the Minnesota iron ores.

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—— What constitutes the Taconic mountains? [Abstract.]

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—— Metamorphism of clastic feldspar in conglomerate schist.

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—— On some occurrences of ottrelite and ilmenite schist in New England.

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with volume 6, Geological Survey of Illinois.

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Illinois, Geol. Survey, Geology and Paleontology, vol. 8, pp. 25-67, 1890.

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Am. Geologist, vol. 8, pp. 330-331.

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— Additional notes concerning the Nampa image.

Boston Soc. Nat. Hist., Proc., vol. 25, pp. 242-246.

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— Man and the glacial period.

Popular Science Monthly, vol. 39, pp. 314-319.

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WITH THE LAWS GOVERNING THEIR PRINTING AND DISTRIBUTION

BY

PHILIP CREVELING WARMAN

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CONTENTS.

	Page.
Letter of transmittal	7
Notice	8
Preface	9
Laws relating to the publications of the U. S. Geological Survey	11
Bibliography of the publications of the U. S. Geological Survey	15
Annual Reports	17
Monographs	91
Bulletins	127
Reports on Mineral Resources	247
Geologic Atlas of the United States and auxiliary and subsidiary maps	305
Geologic folios	305
Topographic atlas sheets	307
Special topographic sheets	320
Miscellaneous topographic maps	320
Miscellaneous publications	321
Circulars of instructions	321
Regulations	322
Circular concerning publications	322
Guyot's tables	322
History of American State surveys	323
Rules and suggestions for preparation of manuscript and illustrations	323
Johnson's report on the iron regions of Louisiana and Texas	323
Digest of decisions concerning water in the arid region	324
Index to the publications of the U. S. Geological Survey	325

LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C., April 20, 1893.

SIR: I have the honor to transmit herewith the manuscript of a bibliography and index of the publications of the Geological Survey, with a compilation of the laws governing their printing and distribution, prepared with a view to its publication as a bulletin.

Permit me to make use of this opportunity to thank you for the privilege of diverting a portion of my attention to this work and for your constant support and encouragement while engaged therein.

P. C. WARMAN.

Hon. J. W. POWELL,
Director.

NOTICE.

All the publications of the U. S. Geological Survey are either sold or exchanged for scientific works of like value except the series of Annual Reports. The larger portion of the Survey's quota of the latter, also, go regularly to institutions and individuals with whom the Survey has established exchange relations, so that only a limited number of any Annual are available for gratuitous distribution, and these are quickly exhausted. The earlier Annuals can no longer be supplied by the Geological Survey, but the Secretary of the Interior has a small number for sale at cost of paper, printing, and binding. The Monographs, Bulletins, and Mineral Resources are purchasable of the Director of the Geological Survey at like low prices, which are given individually throughout the bibliography in this Bulletin. Checks, drafts, or postage stamps can not be received; all remittances must be for the exact amount in currency or by postal note or money order made payable to the Chief Clerk of the U. S. Geological Survey.

PREFACE.

The publications of the U. S. Geological Survey catalogued and indexed herein are: Annual Reports 1 to 12, Monographs I to XX, Bulletins 1 to 99 (except 87, 88, and 89, reserved as numbers of a series not yet completed), the first eight volumes of Mineral Resources (1882–1891), such portions of the Geologic Atlas, with auxiliary and subsidiary maps, as have been completed, and a few miscellaneous brochures. The work has been done incidentally to the compiler's regular official duties, and therefore in a desultory manner, occupying his attention, now five minutes, now a half hour, through more than a year's time.

In the bibliographic work no limitations of detail were set, and the information given approximates completeness. Respecting the index, however, the intention has been to avoid much elaboration, which the Director of the Survey thought not highly desirable. The plan contemplated a broad and systematic classification of contents, alphabetically arranged, rather than a detailed and full index composed of unrelated items. To this end the large domain of knowledge into which the publications of the Geological Survey enter has been conceived as falling into the following fields: Geology (structural), geologic processes, petrography, paleontology, topography, and chemistry and physics. Under these names themselves and under the names of grand divisions in each of these fields entries have been grouped. For example, entries of a more strictly geologic character will be found aggregated under the period names of the stratigraphic column—Archean, Algonkian, Cambrian, Silurian, etc.; geologic processes, under the names of the processes, as Degradation, Metamorphism, Volcanism, etc.; those of a paleontologic nature, under Paleontology, Paleobotany, Plants, Vertebrate, Invertebrate, Brachiopoda, Lamellibranchiata, Pteropoda, etc.; those of a petrographic character, under Petrography, Lithology, Igneous, Sedimentary, Rocks, etc.; and so on. The names of states and countries have been treated as leading words, and so of course have the names of authors; and each paper has been entered under every significant word in its title.

For many of the bibliographic details the writer is indebted to Mr. James C. Pilling, who, while Chief Clerk of the Survey, was in the habit of making memoranda of such matters as they passed through his hands; and he has contributed valued suggestions during the reading of the proof. Any excellence the index may be found to possess is due in large measure to Mr. G. K. Gilbert, who is responsible for interesting the writer in the project and who has at all times been found ready to advance it by advice and aid, and to Messrs. Whitman Cross, A. C. Peale, Charles S. Prosser, and I. C. Russell, who have kindly rendered assistance in special lines.

P. C. W.

WASHINGTON, D. C., *May 25, 1893.*

LAWS RELATING TO THE PUBLICATIONS OF THE UNITED STATES GEOLOGICAL SURVEY.

The legal provisions under which the various editions of the reports the U. S. Geological Survey are published, sold, and distributed e as follows:

GENERAL PROVISIONS IN THE ORGANIC ACT.

he publications of the Geological Survey shall consist of the annual report of rations, geological and economic maps illustrating the resources and classifica-n of the lands, and reports upon general and economic geology and paleontology. e annual report of operations of the Geological Survey shall accompany the nal report of the Secretary of the Interior. All special memoirs and reports of d Survey shall be issued in uniform quarto series if deemed necessary by the ector, but otherwise in ordinary octavos. Three thousand copies of each shall published for scientific exchanges and for sale at the price of publication; and literary and cartographic materials received in exchange shall be the property he United States and form a part of the library of the organization: And the ney resulting from the sale of such publications shall be covered into the Treasury he United States * * * [Approved March 3, 1879.]—*Statutes at Large, vol. 20, 394–395.*

USUAL NUMBER EDITION.

ifteen hundred and fifty copies of any document ordered by Congress shall be nted, and that number shall be known as the usual number. No greater number ll be printed unless ordered by either House or as hereinafter provided.—*Revised tutes, sec. 3792.*

creased for a time to 1,900 to meet the requirements of law, and subsequently decreased to 1,734.

USUAL NUMBER TO BE ADDED TO ALL ORDERS.

esolved by the Senate and House of Representatives of the United States of America in gress assembled, That whenever any document or report shall be ordered printed Congress, there shall be printed, in addition to the number in each case stated, "usual number" of copies for binding and distribution among those entitled to eive them; and this shall apply to all unexecuted orders now in the office of the lic Printer. [Approved July 7, 1882.]–*Statutes at Large, vol. 22, p. 387.*

hen the foregoing joint resolution was approved, monograph II of the survey publications—the one to appear—had just been printed and was then being delivered; it was consequently not covered his resolution, and in order that the same number of copies should be published of it as of the ographs to succeed it, the following joint resolution was subsequently passed:

USUAL NUMBER OF MONOGRAPH II.

esolved by the Senate and House of Representatives of the United States of America in gress assembled, That there be printed at the Government Printing Office the al number of monograph second of the publications of the United States Geo-al Survey, with the necessary illustrations, and to conform to the editions already issued by the Survey. [Approved March 2, 1885.]—*Statutes at Large, vol. 23, p. 519.*

MESSAGE AND DOCUMENTS EDITION.

Of the documents named in this section there shall be printed and bound, in addition to the usual number for Congress, the following numbers of copies, namely:

First. Of the documents accompanying the annual reports of the Executive Departments, one thousand copies for the use of the members of the Senate, and two thousand copies for the use of the members of the House of Representatives.—*Revised Statutes, sec. 3798.*

DEPARTMENTAL EDITION.

Provided, That hereafter the Congressional Printer shall print, upon the order of the heads of the Executive Departments, respectively, only such limited number of the annual reports of such Departments and necessary accompanying reports of subordinates as may be deemed necessary for the use of Congress.—*Revised Statutes, Supplement, p. 93.*

SECOND AND THIRD ANNUALS, SPECIAL EDITION.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there be printed, at the Government Printing Office eleven thousand copies each of the second and third annual reports of the Director of the United States Geological Survey, with the necessary illustrations and charts, five thousand copies of which shall be for the use of the House of Representatives, two thousand five hundred for the use of the Senate, and two thousand five hundred for the use of the United States Geological Survey, and one thousand for sale by the Public Printer, at the cost of publication with ten per cent added thereto; the illustrations and charts to be made by the Public Printer under the direction of the joint committee on printing. [Approved August 5, 1882.]—*Statutes at Large, vol. 22, p. 393.*

FOURTH AND FIFTH ANNUALS, SPECIAL EDITION.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there be printed at the Government Printing Office, in addition to the number already ordered by law, fifteen thousand five hundred copies of each of the Fourth and Fifth Annual Reports of the Director of the United States Geological Survey, uniform with the preceding volumes of the series; of which three thousand five hundred of each shall be for the use of the Senate, seven thousand for the use of the House of Representatives, and five thousand for distribution by the Geological Survey. [Approved June 26, 1884.]—*Statutes at Large, vol. 23, p. 276.*

SIXTH AND SEVENTH ANNUALS, SPECIAL EDITION.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there be printed at the Government Printing Office, in addition to the number already ordered by law, fifteen thousand five hundred copies of each of the sixth and seventh annual reports of the Director of the United States Geological Survey, uniform with the preceding volumes of the series; of which three thousand five hundred shall be for the use of the Senate, seven thousand for the use of the House of Representatives, and five thousand for the distribution by the Geological Survey. [Approved March 2, 1885.]—*Statutes at Large, vol. 23, p. 519.*

EIGHTH AND NINTH ANNUALS, SPECIAL EDITION.

Resolved by the Senate (the House of Representatives concurring herein), That there be printed at the Government Printing Office, in addition to the number already ordered by law, fifteen thousand five hundred copies of the eighth and ninth annual reports

f the United States Geological Survey, uniform with the preceding
ries, of which three thousand five hundred of each shall be for the
, seven thousand for the use of the House of Representatives, and
distribution by the Geological Survey.—*Congressional Record, vol.*
9.

ELEVENTH, AND TWELFTH ANNUALS, SPECIAL EDITION.

House of Representatives (the Senate concurring herein), That there be
vernment Printing Office, in addition to the number already or-
een thousand five hundred copies each of the tenth, eleventh, and
ports of the Director of the United States Geological Survey, uni-
eceding volumes of the series, of which three thousand five hundred
or the use of the Senate, seven thousand for the use of the House
es and five thousand for distribution by the Geological Survey.—
ord, vol. 21, pp. 872, 2142.

DISTRIBUTION OF PUBLIC DOCUMENTS.

ournals, books, and public documents which are or may be author-
outed to incorporated bodies, institutions, and associations within
rritories, shall be distributed to such bodies as shall be designated
of the Interior by each of the Senators from the several States re-
y the Representatives in Congress from each congressional dis-
Delegate from each Territory. The distribution shall be made in
t the quantity distributed to each congressional district and Terri-
al; except that whenever the number of copies of any publication
supply therewith one institution, upon the designation of each
enate and House of Representatives, the copies at the disposal of
y be distributed to such incorporated colleges, public libraries,
ary and scientific institutions, boards of trade, or public associa-
select.

f an institution to receive the documents ordered to be published or
rst session of any Congress shall control the documents of the en-
less another designation be made before any distribution has taken
election first made. Where the same work is printed by order both
House of Representatives, the duplicates may be sent to different
desired, by the member whose right it is to direct the distribu-
ublic documents to be distributed by the Secretary of the Interior
he institutions already designated, unless he shall be satisfied that
ion is no longer a suitable depository of the same. Congressional
lic documents, authorized to be distributed to institutions on the
embers of Congress, shall be sent to such libraries and institutions
ify a willingness to pay the cost of their transportation.—*Revised*
, 502.

TION OF SPECIAL MEMOIRS AND REPORTS OF THE SURVEY.

Senate and House of Representatives of the United States of America
bled, That there shall be distributed from the number of special
orts of the United States Geological Survey now authorized by law
y such publication to every public library which shall be desig-
cretary of the Interior as follows: Two public libraries to be
ach of the Senators from the States, respectively, two public
Representative in Congress from every Congressional district, and
ries by the Delegate from every Territory; such public libraries to
those to which the said publications are distributed under existing
March 3, 1887.]—*Statutes at Large, vol. 24, p. 647.*

SALE OF PUBLIC DOCUMENTS BY THE PUBLIC PRINTER.

If any person desiring extra copies of any document printed at the Gov Printing Office by authority of law shall, previous to its being put to pres the Congressional Printer of the number of copies wanted, and shall pay advance the estimated cost thereof and ten per cent thereon, the Cong Printer may, under the direction of the Joint Committee on Public Printing the same.—*Revised Statutes, sec. 3809.*

SALE OF PUBLIC DOCUMENTS BY THE SECRETARY OF THE INTERIO

Resolved, by the Senate and House of Representatives of the United States of in Congress assembled, That the Secretary of the Interior be, and he is authorized to sell at cost price, to any party wishing to purchase the s public document of which copies available for this purpose, not required fo use, remain: *Provided,* That only one copy of any document be sold to any son. [Approved March 3, 1887.]—*Statutes at Large, vol. 24, p. 647.*

BIBLIOGRAPHY

OF THE

ONS OF THE UNITED STATES GEOLOGICAL SURVEY.

APHY OF THE PUBLICATIONS OF THE U. S. GEOLOGICAL SURVEY.

By P. C. Warman.

ANNUAL REPORTS.

FIRST ANNUAL REPORT, 1879-1880.

nual report of the United States geological survey [by
g, director].

ess, 3d session, house of representatives, ex. doc. 1, part 5, report of
f the interior, being part of the message and documents communi-
o houses of congress at the beginning of the third session of the
gress, in three volumes, vol. II, pp. 333-392; Washington, 1880. 8°.
eport is dated Nov. 1, 1880, and signed Clarence King, director.
of this volume consisted of 1,900 copies, the "usual number." A
(about 800) were, as is customary, delivered unbound; the remain-
) were printed later and bound in sheep, and these constitute vol.
ecutive documents of the house of representatives for the third
rty-sixth congress."
the "usual number" an edition of 3,000 copies of the same docu-
ed, as the law directs, "1,000 copies for the use of the members of
2,000 copies for the use of the members of the house of representa-
3,000 were bound, as is customary, in black cloth. Their title is
hat of the 1,900 edition, with the exception of the omission at the
nation of the congress, session, etc., the title beginning "Report of
the interior." Survey report, pp. 333-392.
900 copies of this volume described above, 750 copies of the same were
r of the secretary of the interior. They are bound in dark red cloth
lows:
| of the | secretary of the interior | on the | operations of the depart-
year ended June 30, 1880 | In three volumes. | Volume II. |
| government printing office. | 1880.
port occupies pp. 333-392.
tion of the director of the survey the secretary of the interior caused
r the use of the survey 2,000 separate copies of the survey report, as

al report | of the | United States geological survey | to
rl Schurz, | secretary of the interior. | By | Clarence
or. |
n: | government printing office. | 1880.

earing title as above within a border; inner title same, no border,
e report, pp. 3-62, 8°, Map. This description applies to one-half

of the edition only; the other 1,000 copies have no map or paper cover, bound in dark red cloth, with the following half-title in gilt on the fro
First annual report | of the | U. S. geological survey | King, 1880

The only other changes from the original issue are of pagination and runn ing on versos, which is changed from "Report of the secretary of the in uniformity with the recto heading—"United States geological survey." accompanying the paper-cover quota is entitled "Map showing geogra visions of the U. S. geological survey, 1880." The "colored areas indicate now [then] organized," all of which are west of the 102d meridian.

Sold by the secretary of the interior, by authority of a joint resolution March 3, 1887, for 50 cents.

All the forms of this survey report thus far described were probably pri the same plates, the type being long primer, with subreports, tables, etc., i By order of the secretary of the interior there were published 1,000 additio of the report, as follows:

First annual report | of the | United States geological su the | hon. Carl Schurz, | secretary of the interior. | By | King, | director. |
Washington: | government printing office. | 1880.

Paper cover bearing title as above within a border; inner title same, verso blank; text, pp. 3-79. Royal 8°. Map, as in the other separate.

The matter was partly, at least, reset, subreports appearing in long pri instead of in brevier. The type page is practically the same size as in t separate, but the work is printed on sheets of royal octavo size.

I have seen the same separate bound in the customary dark red cloth, paper cover, showing that there were two styles of issue, as was the case smaller separate, but I have been unable to ascertain the number of cop of each style; the survey requisition merely called for 1,000 copies.

This report was prepared by Mr. King in the fall of 1880 while engaged work in California, and was transmitted to the secretary of the interior Francisco. The Washington office not having been fully organized, and th no special person to supervise the preparation of the survey reports, thought it best to submit his report in type; therefrom a private edit copies was printed; title and collation as follows:

First | annual report | of the | U. S. geological survey | to the | hon. Carl secretary of the interior. | By | Clarence King, | director.
[San Francisco, Cal.: 1880.]

Paper cover bearing title as above; inner title same, verso blank; t pp. 3-77. 8°.

SECOND ANNUAL REPORT, 1880-1881.

47th congress, | 1st session. | House of representatives. | 1, | part 5. | Report | of the | secretary of the interior; | bei of | the message and documents | communicated to the | two h congress | at the | beginning of the first session of the forty- congress. | In four volumes. | Volume III. |
Washington: | government printing office. | 1882.

Paper cover with title as above; inner title same, verso blank; half-ti port of the director of the United States geological survey", verso blank; transmittal, p. iii, verso blank; table of contents (including list of illus pp. v-x; text (including half-titles of individual papers), pp. xi-lv, 1-56 pp. 567-588. Royal 8°. Plates I-LXI; figs. 1-32; 1 map in pocket. Plat opposite p. 162, is wrongly numbered XXXV.

CONTENTS.

Page.

ort of the director... XI–LV

Administrative reports of... 3–46

physical geology of the Grand cañon district 47-166

tributions to the history of lake Bonneville............................. 167-200

stract of report on geology and mining industry of Leadville............. 201-290

mmary of the geology of the Comstock lode and the Washoo district..... 291-330

on of the precious metals in the United States 331-401

ew method of measuring heights by means of the barometer.............. 403-566

onsisted of 1,900 copies, the "usual number." Of these, about 800
nary, delivered unbound, as described above; the remainder were
bound in sheep as vol. 11 of the "Executive documents of the house
s for the first session of the forty-seventh congress."
n as follows:

the | secretary of the interior; | being part of | the mes-
uments | communicated to the | two houses of con-
| beginning of the first session of the forty-seventh con-
r volumes. | Volume III. |
: | government printing office. | 1882.

verso blank; half-title and remainder of collation and the contents
ng edition.

0 edition; bound in black cloth. Another edition as follows:

ort | of the | secretary of the interior | on the | opera-
epartment | for | the year ended June 30, 1881. | In four
lume III. |
: | government printing office. | 1882.

verso blank; half-title and remainder of collation and the contents
ng editions.

onsisted of 750 copies, ordered by the secretary of the interior for
he department; bound in dark red cloth. Another edition as fol-

ual report | of the | United States geological survey | to
of the interior | 1880–'81 | by | J. W. Powell | direc-
design] |
| government printing office | 1882

verso blank; half-title and remainder of collation and the contents
ng editions, with the exception that this edition has on pp. 565–566
graphic table," followed by an additional plate (LXII), entitled
or computation of thermic correction."

rdered by joint resolution of congress approved August 5, 1882, con-
opies; bound in dark red cloth.

nual is sold by the secretary of the interior, under authority of a
pproved March 3, 1887, at the price of $1.80.

opies of this report were divided into the separate papers of which
d the separates issued with the following titles, etc.:

SEPARATES FROM THE SECOND ANNUAL.

ual report | of the | United States geological survey | to
of the interior | 1880–'81 | by | J. W. Powell | direc-
design] |
| government printing office | 1882

Paper cover with title as above; half-title, "Report of the director of
States geological survey," verso blank; letter of transmittal, p. iii, v
text, pp. xi–lv. Royal 8°. Plates I–VII and fig. 1. (Plates VIII an
volume accompany administrative reports, of which there were no separ
100 copies.

CONTENTS.

Introductory
Tertiary history of the Grand cañon district, by Capt. C. E. Dutton
The history of lake Bonneville, by Mr. G. K. Gilbert
Geology of the Eureka district, by Mr. Arnold Hague
Geology of Leadville, by Mr. S. F. Emmons
Geology of the Comstock lode, by Mr. G. F. Becker
Statistics of coal and iron, by Prof. Raphael Pumpelly
The copper-bearing rocks of lake Superior, by Dr. R. D. Irving
Precious metal statistics, by Mr. Clarence King
History of the Comstock lode, by Mr. Eliot Lord
New method of hypsometry, by Mr. G. K. Gilbert
Plan of publication
  General considerations
  General nomenclature
  Colors for geologic cartography
  Conventional characters for diagrams
Financial statement

Department of the interior—U. S. geological survey | J.
director | The | physical geology | of the | Grand ca
trict | by | Clarence E. Dutton | Extract from the annual
the director of the U. S. geological survey—1880–81 | [Survey
Washington | government printing office | 1882 |

Paper cover with title as above; half-title, "The physical geology o
cañon district, by capt. Clarence E. Dutton, ordnance corps, U. S. a.,"
blank; text, pp. 49–166. Royal 8°. Plates X–XXXVI; figs. 2–16; 1
XXXVI is wrongly numbered XXXV. 100 copies.

CONTENTS.

The Plateau province
Geography of the Grand cañon district
The terraces
  The Eocene
  The Cretaceous
  The Jurassic
  The Trias
  The Vermilion cliffs
  The temples and towers of the Virgen
  The Permian
The great denudation
  Base levels of erosion
The Toroweap and Uinkaret
The Kaibab
  De Motte park
Point Sublime
The excavation of the chasm
  Corrasion
  Weathering

Department of the interior—U. S. geological survey | J.
director | Contributions | to the | history of lake Bonneville |
Gilbert | Extract from the annual report of the director of
geological survey—1880–81 | [Survey design] |
Washington | government printing office | 1882

with title as above; half-title, "Contributions to the history of lake
G. K. Gilbert," p. 167, verso blank; text, pp. 169–200. Royal 8°.
XLIII; figs. 17–21. 100 copies.

CONTENTS.

Page.
.... 169
oscillations 176
laciers 189
anic eruption 190
ntain building 192
.... 200

nt of the interior—U. S. geological survey | J. W. Powell
ostract of a report | upon the | geology and mining indus-
dville Lake co. Colorado | by | S. F. Emmons | Extract
ual report of the director of the U. S. geological survey—
rvey design] |
on | government printing office | 1882

with title as above; half title, "Abstract of report on geology and
y of Leadville, Lake county, Colorado, by S. F. Emmons," p. 201,
ext, pp. 203-290. Royal 8°. Plates XLIV and XLV, which are located
0 and 241. 350 copies—the usual quota of 100 and an additional lot
by the secretary of the interior.

CONTENTS.

Page.
.... 203
ition 207
f Mosquito range 211
-Composition 215
s 215
ations 216
.... 217
.... 218
.... 218
.... 220
neous rocks 221
lville porphyry 222
ies 222
.... 224
-Distribution 225
.... 225
.... 226
.... 231
osits 234
y of the Leadville region 240
ture 240
osquito fault 244
quito and Ball mountain faults 244
mountain and Weston faults 246
ton and Mike faults 249
and Weston faults 251
s gulch 254
ormations 256
.... 257
nes 263
.... 269
.... 277
ort 285
.... 287

tes were ordered by the author and issued in advance of the main vol-
ve title and collate as follows:

Abstract of a report | upon the | geology and mining industry | of | Leadville, Colorado, | with | two colored plates. | By | S. F. Emmons, | geologist-in-charge | Rocky mountain division, U. S. geological survey. | Extract from the annual report of the director of the U. S. geological survey | transmitted December 1, 1881. |

Washington: | government printing office. | 1882.

Paper cover with title as above; "With the compliments of S. F. Emmons," verso blank, 1 l.; title as above, verso blank; list of contents, verso blank; the two colored plates; half-title, "Abstract of report on geology and mining industry of Leadville, Lake county, Colorado, by S. F. Emmons," p. 201, verso blank; text, pp. 203–290. Royal 8°. Plates XLIV and XLV. 250 copies.

Later the author ordered an additional lot; these collate thus:

Paper cover, with title nearly identical with that of the regular official separate; inner title same, verso blank; list of contents, verso blank; text, pp. 203–290. Royal 8°. Plates XLIV and XLV, between pp. 240 and 241. 200 copies.

Department of the interior—U. S. geological survey | J. W. Powell director | A summary | of the | geology of the Comstock lode | and the | Washoe district | by | George F. Becker | Extract from the annual report of the director of the U. S. geological survey—1880–81 | [Survey design] |

Washington | government printing office | 1882

Paper cover with title as above; half-title, "A summary of the geology of the Comstock lode and the Washoe district, by George F. Becker," p. 291, verso blank; two colored plates; text, pp. 293–330. Royal 8°. Plates XLVI and XLVII; figs. 22–26. 100 copies.

CONTENTS.

	Page.
Introductory	293
Decomposition of rocks	295
Propylite	297
The rocks of the Washoe district	298
Structural results of faulting	300
Occurrence and succession of rocks	304
Chemistry	307
Heat phenomena of the lode	310
The lode	314
Physical investigations	319
On the electrical activity of ore bodies	320
On the thermal effect of kaolinization	325

Department of the interior—U. S. geological survey | J. W. Powell director | Production | of the | precious metals | in | the United States | by | Clarence King | Extract from the annual report of the director of the U. S. geological survey—1880–81 | [Survey design] |

Washington | government printing office | 1882

Paper cover with title as above; half-title, "Production of the precious metals in the United States, by Clarence King," p. 331, verso blank; letter of transmittal (dated New York, November 1, 1881), pp. 333–335, verso blank; text, pp. 337–401. Royal 8°. Plates XLVIII–LIII. 100 copies.

CONTENTS.

	Page.
Letter of transmittal	333
Method followed in compilation	337
Classification of mines	341
Classification of reduction works	342
Statistics of the Pacific division	343
California	343

Statistics of the Pacific division—continued. Page.
Nevada 346
Utah 348
Arizona 354
Idaho 355
Oregon 358
Washington 360
Alaska 361
Statistics of the division of the Rocky mountains 361
Colorado 361
Dakota 368
Montana 370
New Mexico 373
Wyoming 374
Statistics of the eastern division 374
Silver contained in placer gold 379
Résumé of reduction statistics 384
Production unaccounted for in the preceding tables 389
Assay value of fine bullion 391
Discount and market value 394
The outlook 395
Final disposition of the precious metals—coinage 395
Consumption of the precious metals in the arts 396
Other estimates of the bullion product 397
Bullion product of the world 399
Explanation of charts 400

Reprinted, with more tabular detail, as: "Department of the interior. Tenth census of the United States. Francis A. Walker, superintendent. Statistics of the production of the precious metals in the United States. By Clarence King, special agent of the census. [Seal of the department of the interior.] Washington: government printing office. 1881." Paper cover with title as above; inner title same, verso blank; table of contents, pp. 5-6; text, pp. 7-94. 4°. Plates A-F, being the same six as in the survey publication.

Appears also, without the plates, as chap. VII of vol. XIII of the Tenth census of the United States, pp. 296-381; Washington, 1885. 4°.

Department of the interior—U. S. geological survey | J. W. Powell director | A new method | of | measuring heights | by | means of the barometer | by | G. K. Gilbert | Extract from the annual report of the director of the U. S. geological survey—1880-81 | [Survey design] | Washington | government printing office | 1882

Paper cover with title as above; half-title, "A new method of measuring heights by means of the barometer, by G. K. Gilbert," p. 403, verso blank; text, pp. 405-566. Royal 8°. Plates LIV-LXII; figs. 27-32. 100 copies.

CONTENTS.

Page.
The problem stated 405
The fundamental principle 405
Barometers 407
Modifying conditions 409
Gradient 412
Devices for the elimination of errors due to gradient 415
Temperature 420
Devices for the elimination of errors due to temperature 423
Humidity 425
Devices for the elimination of errors due to humidity 426
Errors of observation 427
General devices for diminishing hypsometric errors 429
Relative importance of different sources of error 434
The practical problem 435

The new solution..........
The formula..........
Comparative tests..........
Comparison with Williamson's method..........
Comparison with Whitney's method..........
Comparison with Plantamour's method..........
Comparison by means of observations at mount Washington..........
Comparative computations from monthly means..........
Summary..........
Possible improvements..........
1. Redetermination of the constant..........
2. Provision for diurnal periodicity..........
3. Provision for annual periodicity..........
4. Addition of a third base station..........
5. Better form for thermic term..........
6. General provision for non-periodic gradient..........
7. Special provision for non-periodic gradient..........
8. Summary..........
Limitations to utility..........
The work of others..........
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THIRD ANNUAL REPORT, 1881–1882.

47th congress, | 2d session. | House of representatives. |
1, | part 5. | Report | of the | secretary of the interior; | being
the message and documents | communicated to the | two hous
gress | at the | beginning of the second session of the fort
congress. | In four volumes. | Volume III. |
Washington: | government printing office. | 1883.

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ter of transmittal, p. [v], verso blank; table of contents, pp. vii–ix, verso bl
illustrations, pp. xi–xiii, verso blank; text (including half-titles, conten
individual papers, and plate explanations), pp. xv–xviii, 1–550; index, p
Royal 8°. Plates I–XXXV and 1–32; 56 figures.

CONTENTS.

Powell (J. W.), Report of the director..........
Chiefs of divisions, administrative reports of..........
Marsh (O. C.), Birds with teeth..........
Irving (R. D.), The copper-bearing rocks of lake Superior..........
Russell (I. C.), Sketch of the geological history of lake Lahontan..........
Hague (A.), Abstract of report on geology of the Eureka district, Nevada..........
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White (C. A.), A review of the non-marine fossil mollusca of North America..........

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uments | communicated to the | two houses of congress | at
ng of the second session of the forty-seventh congress.
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department | for | the year ended June 30, 1882. | In four
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on: | government printing office. | 1883.

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ual report | of the | United States geological survey | to
ry of the interior | 1881-'82 | by | J. W. Powell | di-
vey design] |
on | government printing office | 1883

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ry of the interior | 1881-'82 | by | J. W. Powell | director |
gn] |
on | government printing office | 1883

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director of the United States geological survey," p. iii, verso blank;
nittal to the secretary, p. [v], verso blank; table of contents (of the
, pp. vii-ix, verso blank; list of illustrations (of the whole volume),
so blank; text, being the director's own report and the administra-
chiefs, pp. xv-xviii, 1-41, verso blank; half-title for accompanying
erso blank. Royal 8°. Plates I and II; figs. 1 and 2. 100 copies.

it of the interior—U. S. geological survey | J. W. Powell
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on | government printing office | 1883

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Marsh," p. 45, verso blank; contents (including illustrations), pp. 47-4
49-88. Royal 8°. Figs. 3-33. 350 copies—100 regular separates and an
lot of 250 ordered by the author.

CONTENTS.

Introduction ....
Description of Hesperornis ....
Restoration of Hesperornis ....
Descripiion of Ichthyornis ....
Restoration of Ichthyornis ....
Conclusion ....

Department of the interior—U. S. geological survey | J. W
director | The | copper-bearing rocks | of | lake Superior | by
Duer Irving | Extract from the third annual report of the d
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Superior, by Roland Duer Irving," p. 89, verso blank; contents (includi
tions), pp. 91-92; text, pp. 93-188. Royal 8°. Plates III-XVII; figs. 34-43.

CONTENTS.

Introductory ....
Extent and general nature of the Keweenaw or copper-bearing series ....
Lithology of the Keweenaw series ....
Structural features of the three classes of rocks of the Keweenaw series ....
General stratigraphy of the Keweenaw ....
The Keweenawan rocks of the south shore of lake Superior ....
The Keweenawan rocks of the north and east shores of lake Superior ....
Relations of the Keweenawan rocks to the associated formations ....
Structure of the lake Superior basin ....
The copper deposits ....

Department of the interior—U. S. geological survey | J. W
director | Sketch | of the | geological history | of | lake Lah
Quaternary lake of northwestern Nevada | by | Israel Cook
Extract from the third annual report of the director—1881-82
design] |
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lake Lahontan, a Quaternary lake of northwestern Nevada, by Israel C.
189, verso blank; contents, p. 191, verso blank; illustrations, p. 193, v
text, pp. 195-235. Royal 8°. Plates XVIII-XXIII; figs. 44-56. 100 copie

CONTENTS.

Introduction ....
Lake Lahontan ....
The smaller fossil lakes of the Great basin ....

Department of the interior—U. S. geological survey | J. W
director | Abstract of report | on the | geology of the Eureka
Nevada | by | Arnold Hague | Extract from the third annual
the director—1881-82 | [Survey design] |
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Paper cover with title as above; half-title, "Abstract of report on geo
Eureka district, Nevada, by Arnold Hague," p. 237, verso blank; content

verso blank; text, pp. 241-290. Royal 8°. Plates XXIV and XXV.

CONTENTS.

	Page.
	241
	244
	248
	254
	260
	264
	268
rocks	273
tiary volcanic rocks	277
ons	288

t ordered by the author have slightly different title, as follows·
he interior—U. S. geological survey | J. W. Powell director | Ab-
on the | geology of the Eureka district | Nevada | by | Arnold
rom the annual report of the director of the U. S. geological sur-
rvey design] |
overnment printing office | 1883
ontents as given above for the regular separates. 150 copies.

of the interior—U. S. geological survey | J. W. Powell
minary paper | on the | terminal moraine | of the | sec-
och | by | Thomas Chrowder Chamberlin | Extract from
l report of the director—1881–82 | [Survey design] |
| government printing office | 1883

h title as above; half title, "Preliminary paper on the terminal
ond glacial epoch, by Thomas C. Chamberlin," p. 291, verso blank;
trations, pp. 293–294; text, pp. 295–402. Royal 8°. Plates XXVI-

CONTENTS.

	Page.
ns	295
cation of drift	296
ion of drift	296
aphical types	304
	310
	313
ns of morainic loops	314
een bay glacier	315
e Michigan glacier	322
and traverse glacier	326
ginaw glacier	327
stern Erie or the Maumee glacier	330
oto glacier	338
and river glacier	341
sumed in the ridged regions	344
lder from the younger moraine	347
nesee glacier	351
cier of the Finger lake region	353
ohawk valley	360
inal moraine of the Hudson river glacier	366
f moraines	369
he coast region	379
nes in the coast region	380
ippewa valley glacier	381
e Superior glacier	382
nnesota valley glacier	388
kota valley glacier	393
issouri coteau	396
the moraine beyond present exploration	401

Department of the interior—U. S. geological survey | J.
director | A review | of the | non-marine fossil mollusca |
America | by | Charles A. White | Extract from the third ann
of the director—1881-82 | [Survey design] |
Washington | government printing office | 1883

Paper cover with title as above; half-title, "A review of the non-m
mollusca of north America, by C. A. White, m. d.," p. 403, verso blan
transmittal, pp. 405-406; contents, p. 407, verso blank; illustrations,
blank; text, pp. 411-486; plate explanations, pp. 488, 490, 492, and the
even numbers (versos) to and including 550, the recto in each case b
Royal 8°. Plates 1-32, each composed of a number of figures. 100 copi

CONTENTS.

Letter of transmittal
Introductory remarks
Annotated and illustrated catalogue
  Conchifera
  Gasteropoda
Tabular view of the non-marine fossil mollusca of North America
Spurious [illegible] doubtful species
General discussion

Besides the regular separates of the last paper, described above, there
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Department of the interior—U. S. geological survey | J.
director | A review | of the | non-marine fossil mollusca |
America | by | Charles A. White | Extract from the annual
the director of the U. S. geological survey—1881-82 | [Survey
Washington | government printing office | 1883 | 5478

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recto in each case being blank; index, pp. i-iii. Royal 8°. Plates 1-3
posed of a number of figures. 100 copies. The number "5478" appeari
of the title is doubtless the requisition number.

FOURTH ANNUAL REPORT, 1882-1883.

48th congress, | 1st session. | House of representatives.
1, | part 5. | Report | of the | secretary of the interior; |
of | the message and documents | communicated to the | t
of congress | at the | beginning of the first session of the fo
congress. | In four volumes. | Volume III. |
Washington: | government printing office. | 1883.

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illustrations, pp. xi-xii; text (including half-titles, contents, etc., o
papers, and plate explanations), pp. xiii-xxxii, 1-464; index, pp. 465-473
Plates I-LXXXV; figs. 1-15.

CONTENTS.

Powell (J. W.), Report of the director
Chiefs of divisions, Administrative reports of
Dutton (C. E.), Hawaiian volcanoes
Curtis (J. S.), Abstract of a report on the mining geology of the Eureka district, Nev

opular fallacies regarding precious-metal ore deposits 253–271
riew of the fossil Ostreidæ of North America, and a comparison of the
ng forms; with appendices by Angelo Heilprin and J. A. Rider 273–430
ological reconnaissance in southern Oregon 431–464

nsisted of 1,900 copies, the "usual number," about 800 of which
bound, as described above; the remainder were printed later and
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he | secretary of the interior; | being part of | the mes-
nents | communicated to the | two houses of congress | at
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g edition.

nsisted of 3,000 copies; bound in black cloth. Another edition as

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g editions.

rdered by joint resolution approved June 27, 1884, consisted of
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or of the United States geological survey," p. iii, verso blank; let-
to the secretary, p. v, verso blank; contents (of the whole vol-
illustrations (of the whole volume), pp. xi–xii; text, being the
port and the administrative reports of the heads of divisions, pp.
half-title for accompanying papers, which page (recto) is numbered
8°. Map (plate I) and figs. 1 and 2. 110 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

Page.
Introduction xiii
Topographic work:
  South Atlantic district xxi
  South Mississippi district xxii
  Rocky mountain district xxii
  Great basin district xxii
  District of the Pacific xxiii
  Special mining districts xxiii
Geologic work:
  Study of the Eureka district by Mr. Arnold Hague xxiv
  Study of glacial phenomena by Prof. T. C. Chamberlin xxv
  Study of metamorphic rocks by Prof. Roland D. Irving xxv
  Study of Quaternary lakes of the Great basin by Mr. G. K. Gilbert xxvi
  Survey of the Cascade range by Capt. C. E. Dutton xxvi
  Survey of the mining districts of Colorado by Mr. S. F. Emmons xxvii
  Survey of the quicksilver districts by Mr. G. F. Becker xxviii
Paleontologic work:
  Work of Prof. O. C. Marsh xxviii
  Work of Dr. C. A. White xxix
  Work of Mr. C. D. Walcott xxix
  Work of Mr. Lester F. Ward xxx
  Work of Mr. Lawrence C. Johnson xxx
Chemic work:
  Physical researches of Dr. Carl Barus and Mr. William Hallock xxx
Statistics:
  Mineral production of the United States, by Mr. Albert Williams, jr xxxi

ADMINISTRATIVE REPORTS.

Report of Mr. Henry Gannett 3
  Mr. Arnold Hague 16
  Mr. G. K. Gilbert 19
  Capt. C. E. Dutton 22
  Prof. T. C. Chamberlin 23
  Prof. R. D. Irving 28
  Mr. S. F. Emmons 34
  Mr. G. F. Becker 39
  Prof. O. C. Marsh 41
  Dr. C. A. White 42
  Mr. C. D. Walcott 44
  Mr. L. C. Johnson 48
  Mr. L. F. Ward 50
  Dr. Carl Barus 52
  Mr. Albert Williams, jr 59

Department of the interior—U. S. geological survey | J. W. Powell director | Hawaiian volcanoes | by | capt. Clarence Edward Dutton | ordnance corps U. S. a. | Extract from the fourth annual report of the director—1882–83 | [Survey design] |
Washington | government printing office | 1884

Paper cover with title as above; half-title, "Hawaiian volcanoes, by capt. Clarence Edward Dutton, ordnance corps, U. S. a.," p. "75–76," verso blank; contents, p. "77–78," verso blank; illustrations, p. "79–80," verso blank; text, pp. 81–219. Royal 8°. Plates II–XXX; figs. 3–5. 210 copies—110 regular separates and 100 extras ordered by the author.

CONTENTS.

Page.
Geography of the Hawaiian islands 81
A journey to Kilauea 92
Kilauea 104
Purlieus of Kilauea 120

Page
Mauna Loa 129
Through Puna to Hilo 146
From Hilo to Mauna Kea 152
Mauna Kea 161
Hamakua—Kohala—Hualalai 169
Kona—Eruption of 1868 175
The volcanic problem 183
Maui 199
Oahu 212

Department of the interior—U. S. geological survey | J. W. Powell director | Abstract of a report | on the | mining geology | of the | Eureka district Nevada | by | Joseph Story Curtis | Extract from the fourth annual report of the director—1882–83 | [Survey design] |
Washington | government printing office | 1884

Paper cover with title as above; half-title, "Abstract of a report on the mining geology of the Eureka district, Nevada, by Joseph Story Curtis," p. 221, verso blank; contents and illustrations, p. 223, verso blank; letter of transmittal to the director by G. F. Becker, geologist in charge (dated San Francisco, June 1, 1883), pp. 225–226; text, pp. 227–251. Royal 8°. Plates XXXI–XXXIII. 110 copies.

CONTENTS.

Page.
Letter of transmittal 225
General outline of Eureka district 227
The structure of Prospect mountain 233
The structure of Ruby hill 236
  Occurrence of the ore 244
  The source of the ore 247
  The ore 250
Future of Ruby hill 251

Department of the interior—U. S. geological survey | J. W. Powell director | Popular fallacies | regarding | precious-metal ore deposits | by | Albert Williams jr. | Extract from the fourth annual report of the director—1882–83 | [Survey design] |
Washington | government printing office | 1884

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CONTENTS.

Page.
Introduction 257
Local prejudices against formations and in favor of others 257
The supposition that the richness of mineral veins usually increases with depth 259
The prejudice against "specimen" mines 262
The prejudice in favor of certain strikes and against others 263
The predilection for "true fissures" 264
The block system of underground prospecting 264
The prejudice against bedded deposits and veins of small dip 266
That the appearance of ores is a trustworthy index of their value 267

Department of the interior—U. S. geological survey | J. W. Powell director | A review of the | fossil Ostreidæ | of North America | and | a comparison of the fossil with the living forms | by | Charles A. White, m. d. | with appendices by prof. Angelo Heilprin and mr. John

A. Ryder | Extract from the fourth annual report of the
1882–83 | [Survey design] |
Washington | government printing office | 1884

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etc., p. 273, verso blank; contents, p. 275, verso blank; illustrations,
blank; letter of transmittal to the director, pp. 279–280; text by White
appendix I, by Heilprin, pp. 309–316; appendix II, by Ryder, pp. 317–3
tion of plates, pp. 334, 336, 338, and consecutive even pages to and inclu
recto in each case being blank. Royal 8°. Plates XXXIV–LXXXII, most
posed of several figures each. 160 copies—110 regular separates and 50 e
by the author.

CONTENTS.

Letter of transmittal
Introduction
Carboniferous
Jurassic
Cretaceous
Laramie group
Appendix I.—North American Tertiary Ostreidæ, by Prof. Angelo Heilprin
    Eocene
    Oligocene
    Miocene
    Pliocene
    Post-Pliocene
Appendix II.—A sketch of the life-history of the oyster, by John A. Ryder
Explanation of plates

Department of the interior—U. S. geological survey | J.
director | A | geological reconnaissance | in | southern Ore
Israel C. Russell | Extract from the fourth annual report
rector—1882–83 | [Survey design] |
Washington | government printing office | 1884

Paper cover with title as above; half-title, "A geological reconnaissa
ern Oregon, by Israel C. Russell," p. 431, verso blank; contents and ill
433, verso blank; text, pp. 435–464. Royal 8°. Plates LXXXIII–LXX
110 copies.

CONTENTS.

Introduction
Route of travel
Displacements
    Stein mountain fault
    Warner valley fault
    Abert lake fault
    Summer lake fault
    Surprise valley fault
    Summary of observations relating to displacement
Existing lakes
    Recent changes in existing lakes
Quaternary lakes
    Tufa deposits
Résumé

FIFTH ANNUAL REPORT, 1883-1884.

48th congress, | 2d session. | House of representatives. | E
part 5. | Report | of the | secretary of the interior; | being
the message and documents | communicated to the | two hou

beginning of the second session of the forty-eighth con-
volumes. | Volume III. |
| government printing office. | 1884.

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r of the United States geological survey," p. iii, verso blank; let-
p. v, verso blank; contents, pp. vii–x; illustrations, pp. xi–xv;
es, contents, etc., of individual papers, pp. xvii–xxxvi, 1–452; index,
l 8°. Plates I–LVIII (I and II being maps in pocket); figures 1–143.

CONTENTS.

	Page.
of the director	XVII–XXXVI
lministrative reports of	1–66
pographic features of lake shores	69–123
he requisite and qualifying conditions of artesian wells	125–173
ninary paper on an investigation of the Archean formations of ates	175–242
gantic mammals of the order Dinocerata	243–302
ng glaciers of the United States	303–355
of paleobotany	357–452

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which form they constitute vol. 13 of the "Executive documents
resentatives for the second session of the forty-eighth congress."
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ne | secretary of the interior; | being part of | the mes-
nents | communicated to the | two houses of congress |
ng of the second session of the forty-eighth congress. |
s. | Volume III. |
| government printing office. | 1884.

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he edition previously described.
sisted of 3,000 copies; bound in black. Another edition as follows:

he | secretary of the interior | for the | fiscal year end-
84. | In four volumes. | Volume III. |
| government printing office. | 1884.

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report | of the | United States geological survey | to
of the interior | 1883–'84 | by | J. W. Powell | director |
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| government printing office | 1885

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ner editions.
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nd in dark red cloth.
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ed March 3, 1887, at the price of $1.95.
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Fifth annual report | of the | United States geological s
the | secretary of the interior | 1883–'84 | by | J. W. Powell |
[Survey design] |
Washington | government printing office | 1885

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of the director of the United States geological survey," p. iii, verso blar
transmittal to the secretary, p. v, verso blank; contents, pp. vii–x; i
pp. xi–xv, verso blank; report of the director, pp. xvii–xxxvi; administra
of chiefs, pp. 1–66. Royal 8°. Plates I and II (being maps in pocket).

CONTENTS.

REPORT OF THE DIRECTOR.

Topographic work
- North Atlantic district
- South Atlantic district
- Rocky mountain division
- District of the Great basin
- District of the Pacific

Geologic work
- Survey of the Yellowstone national park, by Mr. Arnold Hague
- Studies in Dakota and Montana, by Dr. F. V. Hayden
- Study of glacier phenomena, by Prof. T. C. Chamberlin
- Study of the Archæan rocks, by Prof. Roland D. Irving
- Study of the Quaternary lakes of the Great basin, by Mr. G. K. Gilbert
- Survey of the Cascade range, by Capt. C. E. Dutton
- Survey of the District of Columbia and adjacent territory, by Mr. W J McGee
- Economic studies in Colorado, by Mr. S. F. Emmons
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- Work of Prof. O. C. Marsh
- Work of Dr. C. A. White
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- Work of Mr. Lester F. Ward
- Work of Prof. William M. Fontaine

Chemic work
- Work of Prof. F. W. Clarke

Statistics
- Mineral production of the United States, by Mr. Albert Williams, jr

Preliminary geologic map of the United States and thesaurus of American formations

Bibliography of North American geology

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ADMINISTRATIVE REPORTS.

Report of Mr. Henry Gannett
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- Mr. T. C. Chamberlin
- Prof. Roland D. Irving
- Dr. F. V. Hayden
- Mr. G. K. Gilbert
- Mr. W J McGee
- Capt. C. E. Dutton
- Mr. S. F. Emmons
- Mr. G. F. Becker
- Prof. O. C. Marsh

Page.
Report of Dr. C. A. White 50
    Mr. Charles D. Walcott 52
    Mr. Lester F. Ward 55
    Mr. F. W. Clarke 59
    Mr. Albert Williams, jr 63
    Mr. George W. Shutt 64

Map of the United States | exhibiting | the present status of knowledge | relating to the | areal distribution of geologic groups | (preliminary compilation) | compiled by W J McGee | 1884 | Extract from the fifth annual report of the director of the U. S. geological survey
[Washington: government printing office. 1885.]

Half-title as above, verso beginning of text; text (headed "The general map"), pp. 36-38. 8°. Accompanied by a geologic map of the United States about 17¼ by 28¼ inches in size within the borders.

200 copies of both text and map, published by the department of the interior for gratuitous distribution.

These three pages of text (36-38) are extracted from the fifth annual, and the geologic map is the same as plate II of that annual. The color scheme on p. 36 of this separate, however, differs from that on p. 36 of the volume, and does not conform to the colors actually used on these 200 maps, which are identical in coloring with the volume map; and the map is printed on heavier paper than the folding map for the pocket of the volume. Moreover, 100 of the maps have wide margins. But there were published, in addition, 25 copies of the map (heavier paper, narrow margins) with colors conforming to those named in this separate. And further, there was issued one copy of the map (now in Mr. McGee's possession) in eleven sheets, one for each color.

Department of the interior—U. S. geological survey | J. W. Powell, director | The topographic features | of | lake shores | by | Grove K. Gilbert | (Extract from the fifth annual report of the director, 1883-'84.) | [Survey design] |
Washington | government printing office | 1885

Paper cover with title as above; general half-title for papers accompanying, p. 67, verso blank; half-title, "The topographic features of lake shores, by G. K. Gilbert," p. 69, verso blank; contents, p. 71, verso blank; illustrations, p. 73, verso blank; text, pp. 75-123. Royal 8°. Plates III-XX; figs. 1-6. 310 copies—110 regular separates and 200 extras ordered by the author.

CONTENTS.

Page.
Introduction 75
    Earth shaping 78
Wave work 80
    Littoral erosion 80
    Littoral transportation 85
    Littoral deposition 90
The distribution of wave-wrought shore features 101
Stream work; the delta 104
Ice work; the shore wall 109
Submergence and emergence 110
The discrimination of shore features 112
    Cliffs 112
    Terraces 115
    Ridges 120
The recognition of ancient shores 122

Department of the interior—U. S. geological survey | J. W
director | The requisite and qualifying conditions | of | artesi
by | Thomas C. Chamberlin | (Extract from the fifth annual
the director, 1883–'84.) | [Survey design] |
Washington | government printing office | 1885

Paper cover with title as above; half-title, "The requisite and qua
ditions of artesian wells, by Thomas C. Chamberlin," p. 125, verso
tents, pp. 127–128; illustrations, p. 129, verso blank; text, pp. 131–173.
Plate XXI; figs. 7–31. 610 copies—110 regular separates and 500 extras
the author.

CONTENTS.

Introduction
Essential features of artesian wells
The water-bearing beds
The confining beds
The inclination of the beds
    The reservoir or fountain head
    The collecting area
    Advantages of low inclination of the strata
    Surface condition of the porous bed
Rainfall
    Irrigation by artesian wells
    Adequacy of rainfall measured by capacity of strata
Escape of water at lower levels than the well
Conditions relating to the well itself
    Loss of flow in the well
    Height of flow
    Detection of flow
    Effect of time on flow
Character of the water
Limits in depth
The art of sinking wells
Record of drillings
Areas of favorable, doubtful, and adverse probabilities

Department of the interior—U. S. geological survey | J. W
director | Preliminary paper | on an | investigation of the
formations | of the | northwestern states | by | Roland D. Irv
tract from the fifth annual report of the director, 1883–'84.)
design] |
Washington | government printing office | 1885

Paper cover with title as above; half-title, "Preliminary paper on a
tion of the Archæan formations of the northwestern states, by R. D. Irvi
verso blank; contents, p. 177, verso blank; illustrations, pp. 179–180
181–242. Royal 8°. Plates XXII–XXXI (the last two composed of several fi
figs. 32–35. 210 copies—110 regular separates and 100 extras ordered by

CONTENTS.

Scope of the investigation
    Preliminary geological map of the region
    Problems to be attacked
    General plan of operation
Field investigations
    Investigations in Huronian areas
        Granitic and gneissic areas
Petrographical studies
    Systematic microscopic studies
    Enlargements of mineral fragments in certain detrital rocks
    Metamorphism in the Huronian

t of the interior—U. S. geological survey | J. W. Powell,
e gigantic mammals | of the | order Dinocerata | by |
rsh | (Extract from the fifth annual report of the director,
urvey design] |
n | government printing office | 1885

vith title as above; half-title, "The gigantic mammals of the order
professor O. C. Marsh," p. 243, verso blank; contents, p. 245, verso
tions, pp. 247–248; text, pp. 249–302. Royal 8°. Figures 36–137.
regular separates and 250 extras ordered by the author.

CONTENTS.

Page.
249
256
s 258
ones 259
es 260
nes 262
263
ones 265
s 265
bones 266
s 266
ries 266
267
nes 269
ones 270
272
273
277
277
279
rs 282
rs 283
284
ves 285
288
294
m 298
298
300
300
302

t of the interior—U. S. geological survey | J. W. Powell,
isting glaciers | of the | United States | by | Israel C.
xtract from the fifth annual report of the director,
urvey design] |
n | government printing office | 1885

with title as above; half-title, "Existing glaciers of the United
l C. Russell," p. 303, verso blank; contents, p. 305, verso blank; il-
307, verso blank; text, pp. 309–355. Royal 8°. Plates XXXII–LV;
10 copies.

CONTENTS.

Page.
309
f the Sierra nevada 314
rations 315
rations 324

Ancient glaciers of the Sierra nevada ....
Glaciers of northern California and the Cascade mountains........................
Permanent ice on the mountains of the Great basin....................................
Existing glaciers in the Rocky mountains ....
Glaciers of Alaska ....

Department of the interior—U. S. geological survey | J.
director | Sketch of paleobotany | by | Lester F. Ward | (Ex
the fifth annual report of the director, 1883–'84.) | [Survey
Washington | government printing office | 1885

Paper cover with title as above; half-title, "Sketch of paleobotany,
Ward," p. 357, verso blank; contents, p. 359, verso blank; illustrations,
blank; text, pp. 363–452; index (to the whole volume), pp. 453–469. R
copies—110 regular separates and 50 extras ordered by the author.

CONTENTS.

On the term "Paleobotany"..
Interrelations of geology and biology ....
Scope of the present paper ....
Need of a condensed exhibit...
Future prospects of paleobotany ....
Interdependence of botany and paleobotany ....
Historical view of paleobotanical discovery ....
A.—Biographical sketches..
B.—Sketch of the early history and subsequent progress of paleobotany ....
Nomenclature and classification of fossil plants ....
The natural method as indicated by paleobotany ....
1. Types of vegetation ....
2. The Linnæan system...
3. Systems of the Jussieus ....
4. Systems of modern botanists...
5. Modified system proposed...
6. Classification of the cryptogams..
7. Geognostico botanical view of the plant life of the globe ....

SIXTH ANNUAL REPORT, 1884–1885.

49th congress, | 1st session. | House of representatives.
1, | part 5. | Report | of the | secretary of the interior; | b
of | the message and documents | communicated to the | two
congress | at the | beginning of the first session of the forty-
gress. | In five volumes. | Volume III. |
Washington: | government printing office. | 1886.

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contents, pp. v–viii; illustrations, pp. ix–xi; letter of transmittal, p. xiii,
text, including half-titles, contents, etc., to individual papers, pp. xv–
index, pp. 559–570. Royal 8°. Plates I–LXV (I being a map in pocket);

CONTENTS.

Powell (J. W.), Report of the director...
Chiefs of divisions, Administrative reports of ....
Dutton (C. E.), Mount Taylor and the Zuñi plateau ....
Chamberlin (T. C.) and Salisbury (R. D.). Preliminary paper on the driftless area of
upper Mississippi valley..
Curtis (J. S.), The quantitative determination of silver by means of the microscope...
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st session of the forty-ninth congress."
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cuments | communicated to the | two houses of congress |
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ry of the interior | 1884–'85 | by | J. W. Powell | director |
gn] |
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copies of this report were divided into the papers composing the vol-
parates issued with the following titles:

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on | government printing office | 1885

with title as above; inner title same, verso blank; half-title, "Re-
rector of the United States geological survey," p. iii, verso blank;
e whole volume), pp. v–viii; illustrations (of the whole volume), pp.
nk; letter of transmittal, p. xiii, verso blank; report of the director,
dministrative reports of chiefs, pp. 1–101. Royal 8°. Plates II–X.
p in pocket, and though pertaining to this portion of the volume, it
pany these separates.) 100 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

Page.
tal.. xiii
.... xv
.... xxi

Chemistry
Physical researches
Lithology
Statistics
Illustrations
Library
Publications
General geology
Economic geology
Appointments
Government and state surveys
Office of the survey
Financial statement
Reports of operations

ADMINISTRATIVE REPORTS.

Report of Mr. Henry Gannett
  Prof. Raphael Pumpelly
  Prof. N. S. Shaler
  Mr. G. K. Gilbert
  Mr. W J McGee
  Mr. T. C. Chamberlin
  Prof. R. D. Irving
  Dr. F. V. Hayden
  Mr. Arnold Hague
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Paper cover with title as above; half-title, "Mount Taylor and the by capt. Clarence E. Dutton, ordnance corps, U. S. a.," p. "105–106," contents p. "107–108," verso blank; illustrations, p. "109–110," verso of transmittal to the director, p. "111–112," verso blank; text, pp. 11 8°. Plates XI–XXII; figs. 1–25. 100 copies.

CONTENTS.

Letter of transmittal
The plateau country at large
The general features of the district
  The stratigraphy
The Zuñi plateau
  The Nutria monocline
Mount Taylor and vicinity
  Recent lavas of the San José valley
General conclusions

Department of the interior—U. S. geological survey | J. W. Powell, director | Preliminary paper | on the | driftless area of the upper Mississippi valley | by | T. C. Chamberlin and R. D. Salisbury | Extract from the sixth annual report of the director, 1884–85 | [Survey design] | Washington | government printing office | 1886

Paper cover with title as above; half-title, "Preliminary paper on the driftless area of the upper Mississippi valley, by T. C. Chamberlin and R. D. Salisbury," p. 199, verso blank; table of contents, pp. 201–202; illustrations, p. 203, verso blank; text, pp. 205–322. Royal 8°. Plates XXIII–XXIX; figs. 26–48. 100 copies.

CONTENTS.

Page.

Introduction 205
  Significance of phenomena 205
  Table of Quaternary formations of the interior 211
Correlative features and stratigraphy 217
  General relationships 217
    Form 217
    Location 217
    Drainage relations 217
    Topographical relationships 218
  Stratigraphy of the region 219
Pre-glacial degradation and residuary products 221
  Erosion and its results 221
    Erosion history 221
    Channelings of the region 225
    Flat-bottomed valleys 226
    Slit-bottomed valleys 226
    Diversities due to stratal inequalities 227
    Longitudinal profile of valleys 228
    The absence of falls in the driftless region 228
    Rarity of constricted gorges 229
    Special instance of valley sculpture—the Mississippi valley 230
    The reliefs of the region 234
    Forms of ridges 234
    Evidence of non-glaciation 237
  Residuary products 239
    Physical characteristics of residuary earths 240
    Formation of residuary earths 242
    Microscopic character of residuary earths 244
    Size of particles 248
    Chemical constitution of the residuary earths 249
    Rock relics 251
    Amount of residuary material 254
    Rock surface 256
    Capacity of the valleys and its relation to the amount of residuary material 257
Circumjacent glacial phenomena 259
  Border of the driftless area 259
  Morainic border 259
    The fringing deposits of glacial waters 261
    The fringing deposits of ponded waters 262
  Attenuated till and bowlder border 264
    Nature of the border 265
    Course of the border of the old drift 268
    Absence of valley drift 270
  Attenuated pebble drift border 271
    Distribution 275
    Method of deposit 277
The loess 278
  Differential characters 278
    Chemical and mineralogical constitution 281
    Distribution 283
    Later fluvial loess 285
    Fossils 285

The loess—continued.
  Origin of the loess ....
    Æolian hypothesis ....
    Ice dams ....
    Ice attraction and crust deformation ....
    Possibilities of ice attraction..............................
    Crust changes..............................
    Deformations produced by ice..............................
    Source of the silt..............................
    Time of the deposit ....
    The assortment of the material..............................
Terraces..............................
  Terraces of the glacial flood deposits..............................
History and genesis ....
  Sequence of events..............................
  Origin of the driftless region..............................
    The zone of waste..............................
    Climatic influences ....

Department of the interior—U. S. geological survey | J. W
director | The | quantitative determination of silver | by mea
microscope | by | Joseph Story Curtis | Extract from the six
report of the director, 1884–85 | [Survey design] |
Washington | government printing office | 1886

Paper cover with title as above; half-title, "The quantitative deter
silver by means of the microscope, by Joseph Story Curtis," p. 323, v
contents, p. 325, verso blank; illustrations, p. 327, verso blank; text,
Royal 8°. Plate XXX; figs. 49 and 50. 300 copies—100 regular separa
extras ordered by the author.

CONTENTS.

The Plattner scale..............................
The micrometer measuring apparatus ....
Manipulations before measuring..............................
Method of calculation..............................
The determination of small quantities of silver in country rocks..............................
Table showing weights of silver beads, number of ounces to the ton, etc..............................

Department of the interior—U. S. geological survey | J. W
director | Preliminary report | on | sea-coast swamps of th
United States | by | Nathaniel Southgate Shaler | Extract
sixth annual report of the director, 1884–85 | [Survey design
Washington | government printing office | 1886

Paper cover with title as above; half-title, "Preliminary report o
swamps of the eastern United States, by Nathaniel Southgate Shaler," p
blank; contents, p. 355, verso blank; illustrations, p. 357, verso blank; te
398. Royal 8°. Figures 51–57. 200 copies—100 regular separates and
ordered by the author.

CONTENTS.

General introduction ....
The coast swamps of New England ....
Economic problems connected with marine swamps ....
Detailed account of selected areas of salt marsh lands..............................
  Plum island marshes ....
  Green harbor river diked lands ....
Principal areas of salt marshes between the Hudson river and Portland, Maine..............................

Department of the interior—U. S. geological survey | J. W
director | Synopsis | of the | flora of the Laramie group | by

ract from the sixth annual report of the director, 1884–85
ign] |
| government printing office | 1886

ith title as above; half-title, "Synopsis of the flora of the Laramie F. Ward," p. 399, verso blank; contents, p. 401, verso blank; illus- erso blank; text, pp. 405–549; list of species illustrated, pp. 549-557. s XXXI–LXV. 100 copies.

CONTENTS.

Page.
.... 405
opinion 406
the Laramie group 433
ramie age 436
able of distribution 440
of Laramie, Senonian, and Eocene plants 443
le of distribution 515
fossil plants from the Laramie group 536
Lower Laramie strata 537
fort Union group 542
rated 549

SEVENTH ANNUAL REPORT, 1885-1886.

ess, | 2d session. | House of representatives. | Ex. doc.
eport | of the | secretary of the interior; | being part of |
nd documents | communicated to the | two houses of con-
| beginning of the second session of the forty-ninth con-
volumes. | Volume III. |
: | government printing office. | 1888.

with title as above; inner title same, verso blank; half-title, report of the director of the United States geological survey," p. contents, pp. v-xiv; illustrations, pp. xv-xx; letter of transmittal, ; text, with half-titles, contents, and illustrations to individual 6; index, pp. 647–656. Royal 8°. Plates I–LXXI (I and IV being ocket); figs. 1–114.

CONTENTS.

Page.
rt of the director 3–42
Administrative reports of.. 43–143
The rock-scorings of the great ice invasions 147–248
idian cliff, Yellowstone national park 249–295
rt on the geology of Martha's vineyard.. 297–363
ne classification of the early Cambrian and pre-Cambrian formations; a
f principles, illustrated by examples drawn mainly from the lake Superior
.... 365–454
structure of the Triassic formation of the Connecticut valley.. 455–490
t-making processes in the United States.. 491–535
geology of the head of Chesapeake bay 537–646

onsisted of 1,734 copies, the "usual number," about 600 of which bound, as described above; the remainder were printed later and as vol. 10 of the "Executive documents of the house of representa- ond session of the forty-ninth congress."

on as follows:

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ments | communicated to the | two houses of congress |

at the | beginning of the second session of the forty-ninth
In five volumes. | Volume III. |
Washington: | government printing office. | 1888.

Advertisement of survey publications, pp. i–iv; library catalogu
ples), p. v, verso blank; title as above, verso blank; half-title and
collation, and the contents, as in the edition previously described.

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follows:

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June 30, 1886. | In five volumes. | Volume III. |
Washington: | government printing office. | 1888.

Collation and contents as in the 3,000 edition, described next above.

This edition consisted of 750 copies; bound in dark red cloth. An
as follows:

Seventh annual report | of the | United States geological
the | secretary of the interior | 1885–'86 | by | J. W. Powell |
[Survey design] |
Washington | government printing office | 1888

Collation and contents as in the 3,000 edition, described above.

This edition, ordered by joint resolution approved March 2, 1885,
15,500 copies; bound, as usual, in dark red cloth.

The seventh annual is sold by the secretary of the interior, under a
joint resolution approved March 3, 1887, at the price of $1.60.

One hundred and ten copies of this report were divided into the se
composing the volume and the separates issued with the following tit

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to the | secretary of the interior | 1885–'86 | by | J. W. Po
tor | [Survey design] |
Washington | government printing office | 1888

Paper cover with title as above; inner title the same, verso blan
"Seventh annual report of the director of the United States geolog
p. iii, verso blank; contents (of the whole volume), pp. v–xiv; illustr
whole volume), pp. xv–xx; letter of transmittal to the secretary, p. 1,
report of the director, pp. 3–42; half-title to administrative reports of
verso blank; administrative reports of chiefs, pp. 45–143. Royal 8°.
pertain to the text of this separate, but I and IV (being maps in po
accompany it; the others do. 110 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

Letter of transmittal ....
Remarks on the plan and organization of the survey ....
  The geographic division ....
  The geologic divisions ....
  The accessory divisions ....
  Schedule of organization ....
Topographic work ....
Geologic work ....
  The investigation of the Archæan rocks ....
  The surveys of the Atlantic coast...

Geologic work—continued. Page.
The surveys of the Appalachian region ... 19
The surveys of the lake Superior region ... 20
The investigations in glacial geology ... 21
The surveys in Montana ... 23
The researches in the Yellowstone national park ... 23
The surveys in Colorado ... 24
The surveys in California ... 25
The researches in volcanic geology ... 26
The investigations in the lower Mississippi region ... 27
The investigations on the Potomac river ... 28
Paleontologic work ... 29
The researches in vertebrate paleontogy ... 29
The researches in Paleozoic invertebrate paleontology ... 30
The investigation of Mesozoic invertebrate fossils ... 31
The study of Cenozoic invertebrate fossils ... 32
The researches in paleobotany ... 33
The researches in fossil insects ... 34
Miscellaneous ... 35
Work in the division of chemistry and physics ... 35
Researches on sea level as affected by the attraction of adventitious masses ... 36
Work in the division of mining statistics and technology ... 38
Office of the survey ... 41
Acknowledgments ... 41
Financial statement ... 42

ADMINISTRATIVE REPORTS.

Report of Mr. Henry Gannett ... 45
Mr. Raphael Pumpelly ... 60
Mr. N. S. Shaler ... 61
Mr. G. K. Gilbert ... 65
Mr. R. D. Irving ... 68
Mr. T. C. Chamberlin ... 76
Mr. F. V. Hayden ... 85
Mr. Arnold Hague ... 87
Mr. S. F. Emmons ... 91
Mr. G. F. Becker ... 93
Mr. C. E. Dutton ... 97
Mr. L. C. Johnson ... 103
Mr. W J McGee ... 104
Mr. O. C. Marsh ... 111
Mr. C. D. Walcott ... 113
Mr. C. A. White ... 117
Mr. W. H. Dall ... 120
Mr. L. F. Ward ... 123
Mr. S. H. Scudder ... 127
Mr. F. W. Clarke ... 127
Mr. Albert Williams ... 130
Mr. G. W. Shutt ... 135
Mr. W. H. Holmes ... 136
Mr. C. C. Darwin ... 138

Department of the interior—U. S. geological survey | J. W. Powell, director | The rock-scorings | of the | great ice invasions | by | Thomas Chrowder Chamberlin | Extract from the seventh annual report of the director, 1885–1886 | [Survey design] |
Washington | government printing office | 1888

Paper cover with title as above; half-title, "The rock-scorings of the great ice invasions, by T. C. Chamberlin," p. 147, verso blank; contents, pp. 149–151, verso blank; illustrations, pp. 153–154; text, pp. 155–248. Royal 8°. Plate VIII; figs. 1–50. 110 copies.

CONTENTS.

Page.

Geographical distribution of striæ 155
  Extent of the ice invasion 155
  Disparity of distribution of striæ 158
    Illusory irregularity of present mapping 159
    Postglacial destruction of striæ 159
    Unequal search for striæ 159
    Unequal detection of striæ 159
    Original distribution of striæ 159
Topographical relations of the striæ 160
  Range of striæ in altitude 160
  Upper limit of glacial markings 161
  The margin of glaciated area vertically undulatory 162
Varying position of the striated surface 162
  Striæ on level plains 163
  Striæ on descending plane surfaces 165
  Striæ on ascending plane surfaces 167
  Relations of the striæ to the inclined surfaces 168
  Striæ on vertical surfaces 169
    (1) Horizontal 169
    (2) Descending 171
    (3) Ascending 173
  Striæ on terraced surfaces 174
  Striæ on rounded angles 175
  Striæ on horizontally curved surfaces 177
  Striæ on obliquely curved surfaces 177
  Striæ on vertically arched surfaces 177
  Striæ on domes 178
  Striæ on warped surfaces 179
Topography as affecting the distribution of striæ 181
  Distribution and direction of striæ 181
  Distinction between glacial borders 182
  Influence of deeply overridden topography on glacial currents 185
  Temperature and saturation as affecting glacial movement 186
  Pressure as affecting plasticity 187
  Rate of flowage as affecting the course of striæ about obstacles 191
  The forms of prominences as affecting the course of flow about them 191
  The element of magnitude 191
  Miniature ridges behind hard knobs 193
  Grooving in front of obstacles 194
  Absence of grooving in front of obstacles 196
  Deflection of currents in crossing valleys 197
Cross striation 200
  Varying effects of topography in successive stages 200
    Changes of glacial movement during a symmetrical retreat 201
    Changes of movement due to varying topographic influence, producing an unsymmetrical retreat 201
    Changes of movement due to inequalities of supplies 202
    Changes of movement due to varying rates of ablation 203
    Changes of movement due to glacial drainage 203
    Changes of movement due to the seasons 203
    Changes of movement due to solar action 204
    Changes of movement due to climatic periods 204
    Changes of movement due to inequalities of debris covering 205
    Changes of course due to possible movements of the earth's crust 205
Scoring action and the scorings 207
  I. Disruption by glacial action 209
      Inthrusting of drift 210
  II. Glacial grooves 211
      Pre-existent grooves 211
      Single grooves 213
      Compound grooves 214
  III. Striation 216
    Definition of the lines 216
      "Chatter marks" 218

the scorings—continued.

Page.
grooves 219
tic gouges 219
tic cross fractures 221
g gouges 222
furrows 222
in the width and depth of striæ 223
in length of striæ 224
d continuity of striæ 225
y or deviation of direction 225
striæ 225
l striæ 225
ed striæ 225
striæ 226
d iceberg striæ 227
triæ 229
disappearance of striæ 229
of striation 230
s by which scoring debris was brought into action 235
ing 235
ipitation through crevasses 236
si-fluidal movement 236
itation 236
vation from the bottom 237
tion 237
ual action of subglacial debris 237
scoring debris from activity 238
tion 238
si-fluidal movements 239
oval of the rider 239
hing 289
ring out 239
.... 240
olishing 240
lishing 241
shing distinguishable from that of wind or of water 241
.... 242
triation in estimating glacial erosion 243
on the character of the striated surface 243
ining the point of motion 244
ls 244
.... 245
e distal side of cavities 245
.... 246
henomena 246
prominences 246
of "plucking" 246
.... 246
e ends of scratches 246
bble 247
.... 247
ges 248
ks 248

t of the interior—U. S. geological survey | J. W. Powell,
sidian cliff | Yellowstone national park | by | Joseph Pax-
| Extract from the seventh annual report of the director,
Survey design] |
n | government printing office | 1888

vith title as above; half-title, "Obsidian cliff, Yellowstone national
n P. Iddings," p. 249, verso blank; contents, p. 251, verso blank;
. 253–254; text, pp. 255–295. Royal 8°. Plates IX–XVIII; figs. 51-54.
regular separates and 150 extras ordered by the author.

CONTENTS.

Page.

Introduction 255
Geological occurrence 255
Lithological structure 257
  Columnar cracking 257
  Lamination 260
Petrographical character 261
  Obsidian 261
  Spherulites 262
    Hollow spherulites 263
  Lithoidite 264
  Lithophysæ 265
    Minerals composing lithophysæ 266
      Quartz 267
      Tridymite 267
      Feldspar 267
      Fayalite 270
Microscopical characters 273
  Trichites and microlites 273
  Granophyre groups 274
  Spherulites 276
    Porous spherulites 278
  Fayalite 278
Origin of fayalite and lithophysæ 279
  Mineral association 279
  Chemical evidence 282
  Conclusion 283
  Apparent exceptions 283
Development of various structures in obsidian 284
  Conditions modifying the development of lithophysæ 286
  The cause of different layers of lamination 286
Historical review 287
Geographical distribution of obsidian 290
  Conclusion 294

Department of the interior—U. S. geological survey | J. W. Powell, director | Report | on the | geology of Martha's vineyard | by | Nathaniel Southgate Shaler | Extract from the seventh annual report of the director, 1885–1886 | [Survey design] |
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CONTENTS.

Page.

Introduction 303
General geological relations of this area 304
Surface contour of Martha's vineyard 306
Glacial deposits of Martha's vineyard 308
  Ordinary ground moraines 309
  Frontal moraine drift 311
  Kame and terrace drift 314
  Origin of glacially transported materials 322
Cretaceous rocks of Martha's vineyard 325
Tertiary rocks of Martha's vineyard 326
  Stratigraphy of the Vineyard series 328
  Analyses of dips in Vineyard series 330
  Origin and nature of the rocks of the Vineyard series 333
  Deposits of doubtful age 340
  Dislocations of the Vineyard series 343

Page.
Postglacial erosion of Martha's vineyard 347
Postglacial fossiliferous deposits of Martha's vineyard 351
No man's land 352
Economic resources of Martha's vineyard 353
Mineral resources of Martha's vineyard 355
Clays 355
Lignites 357
Phosphates 357
Iron ores 358
Mineral waters 358
Analyses 359
Appendix 361

Department of the interior—U. S. geological survey | J. W. Powell, director | On the classification | of the | early Cambrian and pre-Cambrian formations | by | Roland Duer Irving | Extract from the seventh annual report of the director, 1885-1886 | [Survey design] | Washington | government printing office | 1888

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CONTENTS.

Page.
The problem stated 371
Paleontological characters as a basis for classification 372
The use of fossils in determining the grander groups of strata 372
The use of fossils in establishing correlations within one geological basin 374
The use of fossils in establishing general correlations 375
Lithological characters as a basis for classification 377
The use of lithology in marking off the grander groups of strata 377
The use of lithological characters in establishing correlations between different portions of the same geological basin 378
The use of lithological characters in establishing correlations between the stratal groups of different geological basins 380
Unconformity as a basis for classification 390
General nature and significance of unconformities 390
True unconformity 390
The erosion interval 392
Overlap 394
Distinguishing characters of true unconformities, with examples 395
Cases in which the overlying strata are undisturbed 395
Visible superpositions 395
Lateral contacts 396
Basal conglomerates 397
Relation of eruptives to unconformable contacts 399
The general relative attitudes of unconformable formations 399
Examples 399
Pre-Potsdam land surface of central Wisconsin 399
The sub-Potsdam land surface in the Marquette and Menominee regions of Michigan 409
The Potsdam-Huronian unconformity of the north shore of lake Huron 411
The Potsdam-Keweenaw unconformity 412
Pre-Potsdam land surface of the Grand cañon region 414
Cases in which overlying strata are inclined 414
Relations of the rock belts of the discordant formations 415
Relative lithological characters of the discordant formations 416
Relative structural characters of the discordant formations 416
Relations of eruptives to the contact of the discordant formations 416
Minor phenomena of the contact line—basal conglomerates 417
Examples 417

Unconformity as a basis for classification—continued. Page.

Unconformities between the Animiké series of the north side of lake Superior and the adjacent formations 417
Unconformities of the Penokee-Gogebic region of northern Wisconsin and Michigan. 423
Cases in which the overlying strata are folded 428
Examples 429
The Laurentian-Huronian unconformity of the north shore of lake Huron 429
The unconformity between the iron-bearing and gneissic series in the Marquette region of Michigan 431
The unconformity between the iron-bearing and gneissic formations in the Menominee region of Michigan and Wisconsin 434
The unconformity among the schistose rocks of the Vermilion lake region 435
Résumé 437
The use of unconformities in classification 438
The use of unconformities in defining the grander groups of strata 438
The use of unconformities in correlating the formations of a single geological basin 439
Correlation of the rock groups and unconformities of the lake Superior region 440
The use of unconformities in establishing general relations 443
Summary of conclusions 446
Taxonomy of the lower part of the geological column 448

Department of the interior—U. S. geological survey | J. W. Powell, director | The structure | of the | Triassic formation of the Connecticut valley | by | William Morris Davis | Extract from the seventh annual report of the director, 1885–1886 | [Survey design] | Washington | government printing office | 1888

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CONTENTS.

Page.

I. The conditions of accumulation 461
Original area of deposits 461
Igneous rocks 462
Dikes 463
Intrusive sheets 463
Overflow sheets 464
Structural significance of overflows 466
Sequence and thickness of the Triassic series 467
Main trap overflow 467
Anterior trap overflow 468
Limestone 468
Posterior trap overflow 468
The Southbury-Woodbury Triassic area 468
II. The structure of the formation 466
General attitude 469
Classes of faults 469
Oblique faults 469
Strike faults 471
Marginal faults 474
Systematic arrangement of faults 474
Faults with reversed throw 477
Folds of the crescentic ridges 477
Summary of structure to be accounted for 481
III. Mechanical origin of the Triassic monocline 481
Conditions of the problem 481
Oblique deposition 481
Contemporaneous disturbance 482
Disturbance by intrusions 482
General tilting and faulting 483
Relation of several Triassic areas 483
Character of the disturbing force 484

origin of the Triassic monocline—continued.

Page.
npression on tilted schists 485
f the faulted Triassic monocline 486
f the crescentic ridges 488
rith reversed throw 489

nt of the interior—U. S. geological survey | J. W. Powell,
alt-making processes | in | the United States | by | Thomas
atard | Extract from the seventh annual report of the
85–1886 | [Survey design] |
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with title as above; half-title, "Salt-making processes in the United
omas M. Chatard," p. 491, verso blank; contents, p. 493, verso blank;
p. 495, verso blank; text, pp. 497–535. Royal 8°. Plates LIII–LV.
is some extras ordered by the author.

CONTENTS.

Page.
.... 497
ine 498
f brine 498
of lime 500
ility of brine 501
val from brine 501
to product of salt 504
cesses 505
.... 506
.... 506
.... 507
n processes 507
ocess 507
ttles 508
pans 509
esses 510
ns 510
tion and management of pans 511
rian pan construction 513
of heat 514
lue construction at Varangeville 515
results 516
n results 517
ons for existing pan blocks 517
iner processes 518
gh or low pressure steam 518
's pipe system 520
of salt product to grainer surface 520
night production in Michigan 520
on of grainer results 521
or Pomeroy method 522
ription of Juhler's works 522
.... 526
.... 527

nt of the interior—U. S. geological survey | J. W. Powell,
he geology | of the | head of Chesapeake bay | by | W J
tract from the seventh annual report of the director, 1885–
ey design] |
on | government printing office | 1888

with title as above; half-title, "The geology of the head of Chesa-
W J McGee," p. 537, verso blank; contents, pp. 539–541, verso blank;
. 543, verso blank; text, pp. 545–646. Royal 8°. Plates LVI–LXXXI;
110 copies.

CONTENTS.

Page.
Introductory note 545
I. Geography 548
The great natural divisions 548
The general hydrography 550
II. Topography 551
General configuration 551
Subordinate configuration 552
Analysis of topography 556
Résumé 564
III. The geologic exposures 564
Exposures in the Piedmont plateau 565
Exposures along the Piedmont margin 567
Exposures along the margin of the Coastal plain 571
The boring within the bay 580
Exposures on the east side of the bay 586
Exposures along Elk river 587
Exposures along Sassafras river 590
IV. The formations 593
Alluvium 593
The Columbia formation 594
Structure and composition 594
Distribution and local variation 598
The low-level phase 601
Altitude and attitude 601
Genesis 602
The littoral phase of the formation 607
Taxonomy 608
The Sassafras river greensand 612
The Potomac formation 613
The Archean (?) 616
V. The displacement 616
Evidences of displacement 616
Position and character of the displacement 619
Geographic extent of the displacement 619
Topographic effects of the displacement 620
The date of the displacement 621
The amount of displacement 623
The rate of displacement 624
Possible cause of the displacement 626
General hypothesis 626
The special conditions 626
The special hypotheses 628
Résumé 633
VI. The general section 634
VII. The Quaternary history recorded in the Columbia formation 638
VIII. The application of the investigation 640
The local application 640
The general application 644

EIGHTH ANNUAL REPORT, 1886-1887.

50th congress, | 1st session. | House of representatives. | Ex. doc. 1, | part 5. | Report | of the | secretary of the interior | being part of | the message and documents | communicated to the | two houses of congress | at the | beginning of the first session of the fiftieth congress. | In five volumes. | Volume III—in two parts. | Part 1 [-2]. |
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pocket); figs. 1–22.
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ven next above, verso blank; text, with half-titles, tables of con-
illustrations of individual papers, pp. 475–1061; index to part 2, p.
Plates LIV–LXXVI; figs. 23–45.

CONTENTS (OF BOTH PARTS).

Page.
rt of the director 3–93
Administrative reports of.......... 95–257
rnary history of Mono valley, California.......... 261–394
y of the Lassen peak district 395–432
fossil butterflies of Florissant.......... 433–474
Trenton limestone as a source of petroleum and inflammable gas in
.... 475–662
ographical distribution of fossil plants.......... 663–960
nary of the geology of the quicksilver deposits of the Pacific slope.......... 961–985
eology of the island of mt. Desert, Maine.......... 987–1061

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Survey design] |
| government printing office | 1889

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CONTENTS.

REPORT OF THE DIRECTOR.

Letter of transmittal ....
Business organization of the survey ....
  Introductory remarks ....
  General plan of the survey ....
  The fiscal system ....
    Principles controlling the system ....
    Appropriations ....
    Method of allotment ....
    Methods of making purchases ....
    Vouchers ....
    Transportation over bonded railroads ....
    Disbursing officers and their specific duties ....
  The custodial system ....
    Principles of the system ....
    Methods employed ....
    Camp equipage and rations ....
    Custodians of property ....
  The museum system ....
    Production of museum property ....
    Acquisition, custody, and transfer of collections ....
  The illustration system ....
    Uses of illustrations ....
    Production, custody, and disposition of illustrations ....

ization of the survey—continued.

Page.
al system.... 36
ns of the editorial system.... 36
s of work 38
nt system.... 40
tions of the survey.... 40
les recognized in the document system.... 46
r and mode of distribution of documents.... 49
system 54
plan of the library 54
ons.... 56
culation.... 57
raphic work.... 58
ery system.... 59
ondence system.... 61
administrative system.... 62
regulations 67
.... 68
cal year 70
topography.... 70
geology.... 74
the geologic map.... 74
f the geologic divisions.... 76
paleontology 80
s pursued 80
attained 81
accessory divisions 83
ry and physics.... 83
statistics 85
neous 87
vestigations.... 88
gas.... 88
rleston earthquake.... 89
hes in terrestrial physics 91
atement 92
gments 93

ADMINISTRATIVE REPORTS.

enry Gannett 97
. S. Woodward 121
Raphael Pumpelly.... 124
N. S. Shaler.... 125
. K. Gilbert 128
R. D. Irving.... 132
T. C. Chamberlin 141
. F. Emmons.... 144
. C. Peale.... 146
rnold Hague 149
eorge F. Becker 153
C. E. Dutton 156
. C. Johnson.... 165
J McGee 166
O. C. Marsh 173
. D. Walcott.... 174
A. White 178
. H. Dall.... 181
ester F. Ward 184
. H. Scudder 188
F. W. Clarke 189
. S. Diller.... 193
avid T. Day.... 195
eorge W. Shutt.... 201
. H. Holmes 202
harles C. Darwin 203
ohn D. McChesney.... 210

Department of the interior—U. S. geological survey | J.
director | Quaternary history | of | Mono valley, California |
C. Russell | Extract from the eighth annual report of th
1886–'87 | [Survey design] |
Washington | government printing office | 1889

Paper cover with title as above; half-title, "Quaternary history of
California, by Israel C. Russell," p. 261, verso blank; contents, pp. 263-
tions, pp. 265–266; prefatory note, p. 267; verso blank; text, pp. 269
8°. Plates XVI-XLIV; figs. 1-12. 110 copies.

CONTENTS.

Prefatory note
The Mono basin
Lacustral history
  The present lake
    Sources of water supply
      Streams
      Springs
    Chemical composition
    Chemical deposits
    Fluctuation of level
  The Quaternary lake
    Sediments
    Chemical deposits
    Thinolite
    Fossils
Glacial history
  The high sierra
  Existing glaciers
    Mt. Dana glacier
    Mt. Lyell glacier
    Parker creek glacier
  Quaternary glaciers of the high sierra
  Névé region and Quaternary glaciers of the Mono basin
    Mt. Dana névé field
    Rush creek névé field
    Lundy cañon glacier
    Leeving creek glacier
    Gibbs cañon glacier
    Bloody cañon glacier
    Parker cañon glacier
    Rush creek glacier
  Glacial phenomena
    Glacial cañons
    Scarps and terraces
    Measure of glacial erosion in cañons
    High lateral cañons
    Glacial cirques
    Glacial erosion and deposition
    Moraines
      Terminal moraines
      Lateral moraines
    Morainal embankments
    Polished and striated surfaces
    Perched bowlders
    Glacial lakes
  Relation of the glaciers to the Quaternary lake of Mono valley
Volcanic history
  Recent volcanic phenomena
      Fumaroles and hot springs
      Modern craters and lava flows

continued.

	Page.
lcanic phenomena	377
ono craters	378
ratified lapilli	386
ated phenomena	387
rographic movements	389
	390
Quaternary times as compared with its present condition	390
eient lake Mono to lakes Bonneville and Lahontan	393

t of the interior—U. S. geological survey | J. W. Powell,
ology | of the | Lassen peak district | by | J. S. Diller |
the eighth annual report of the director, 1886–'87 | [Sur-

n | government printing office | 1889

with title as above; half-title, "Geology of the Lassen peak dis-
Diller," p. 395, verso blank; contents, p. 397, verso blank; illustra-
rso blank; text, pp. 401–432. Royal 8°. Plates XLV–LI; figs. 13–19.

CONTENTS.

	Page.
	401
	401
graphic features	401
of the Lassen peak district	402
	403
tions in the Lassen peak district	403
slate series	404
ntion	404
iferous limestone	304
tine	405
the auriferous slate series	406
-Chico beds	407
sition	407
ution	407
the fossils	409
and lower limits	411
phy of the district during the Chico epoch	411
	413
sition of the Miocene strata	413
ution and relations	413
found in the Miocene strata	419
graphic and climatic conditions during the Miocene	420
	422
val of the piedmont region	425
e sierras	426
uplifting and the faulting of the sierras to each other and to volcanic phe-	428
	430

t of the interior—U. S. geological survey | J. W. Powell,
e | fossil butterflies | of | Florissant | by | Samuel H. Scud-
from the eighth annual report of the director, 1886–'87 |
gn] |
n | government printing office | 1889

with title as above; half-title, "The fossil butterflies of Florissant,
cudder," p. 433, verso blank; contents, p. 435, verso blank; illustra-
erso blank; text, pp. 439–470; plate explanations, pp. 472 and 474,
Royal 8°. Plates LII and LIII; figs. 20–22. 110 copies.

CONTENTS.

Introduction..
    Classified list of known fossil butterflies..
Nymphalidæ..
    Nymphalinæ..
        Vanessidi...
            Prodryas..
            Jupiteria...
            Lithopsyche...
            Nymphalites...
            Apanthesis..
    Libytheinæ..
            Prolibythea...
Papilionidæ...
    Pierinæ...
        Pieridi...
            Stolopsyche...
Appendix (Libythea labdaca)...

Department of the interior—U. S. geological survey | J.
director | The Trenton limestone | as a source of | petroleum a
mable gas | in | Ohio and Indiana | by | Edward Orton | Ex
the eighth annual report of the director, 1886–'87 | [Survey
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Paper cover with title as above; half-title, "The Trenton limestone of petroleum and inflammable gas in Ohio and Indiana, by Edward Or verso blank; contents, pp. 477–479, verso blank; illustrations, p. 481, v text, pp. 483–662. Royal 8°. Plates LIV–LX; 110 copies.

CONTENTS.

Introduction..

CHAPTER I.

Theories respecting the origin of petroleum and natural gas.....................................
    Statement and discussion of theories of chemical origin.....................................
    Statement of theories of organic origin...
        Theory of origin from primary decomposition of organic matter...........................
            Statement of Hunt's theory..
            Statement of theories of indigenous origin..
        Theory of origin from distillation of organic matter....................................
            Statement of Newberry's distillation theory...
            Statement of Peckham's distillation theory..
        Discussion of the several theories of organic origin....................................
            Discussion of Peckham's theory..
            Discussion of Newberry's theory...
            Discussion of Hunt's theory...
        Summary...

CHAPTER II.

Modes of accumulation...
    Composition and order of sequence of petroleum-bearing rocks................................
        Sandstones as reservoirs..
        Limestones as reservoirs..
        Permeability of the reservoirs..
        Relative importance of the elements of an oil series....................................
Effect of disturbances of strata upon the accumulation of oil and gas...........................
    Earlier statements of the anticlinal theory...
    The anticlinal theory as specially applied to gas wells.....................................
    Arrested anticlines...
Structural irregularities in northwestern Ohio..

CHAPTER III.

Page.
il and high-pressure gas in the Trenton limestone of Ohio 520
.... 520
tions 521
ell 525
f the new horizon 529
ess 533
l importance of the new field 536
s rock in Indiana 541

CHAPTER IV.

new gas and oil fields 545
scale 545
on limestone 547
shale 556
a shale 558
n group 559
ra group 561
iagara shale 561
iagara limestone 561
Helderberg series 563
Helderberg limestone 568
ian shale 570
ucture 573
nati uplift 573
stratification in the Wabash valley 580
ors in gas and oil production 581
the Trenton limestone 582
of the Trenton limestone as connected with gas and oil production 587

CHAPTER V.

ent of the gas and oil fields 590
one gas—its composition and uses 590
ure of Trenton limestone gas 593
ock pressure 593
ent of gas wells 598
uction of gas and oil 604
e fields in Ohio 604
y gas field 604
le duration of the gas production 611
of northwestern Ohio, exclusive of Findlay 612
il field 615
re of the field 615
and salt water rock 619
tion and promise of the field 622
ality and the uses of Trenton limestone oil 623
udlay oil field 627
rth Baltimore oil field 629
e gas field in Indiana 631
.... 631
.... 632
scale 633
evonian limestone 633
wer Helderberg limestone (Water-lime) 634
iagara limestone 636
inton limestone 637
udson river shale (Cincinnati group) 637
shale 638
on limestone 639
ucture of the gas field 639
of gas production in Indiana 641
ty of the gas rock 641
of the gas rock 643
of the production 645
ce of oil 645
ressure 645

Practical development of the gas and oil fields—continued. Page.
    - Composition of Indiana gas 646
    - Composition of the gas wells 646
  - Centers of production 647
    - Muncie 648
    - Hartford city 648
    - Anderson 649
    - Marion 649
    - Noblesville 650
    - Kokomo 650

CHAPTER VI.

- Summary 653
  - Table I (statistics of wells) 655
  - Table II (composition of the rock) 661
  - Conclusion 662

Department of the interior—U. S. geological survey | J. W. Powell, director | The geographical distribution | of | fossil plants | by | Lester F. Ward | Extract from the eighth annual report of the director, 1886–'87 | [Survey design] |
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CONTENTS.

Page.
- Introduction 669
  - Relations of the present paper to preceding and to prospective contributions 669
- Enumeration of the localities, with the geological horizons, as far as practicable, at which vegetable remains have been found in the strata of the globe 670
- Geographical distribution 672
  - Europe 672
    - Great Britain 672
    - France 689
    - Spain 702
    - Portugal 705
    - Italy 707
    - Greece 716
    - Roumelia 717
    - Bosnia 717
    - Austrian empire 718
    - Switzerland 738
    - Germany 744
    - Belgium 775
    - Netherlands 777
    - Denmark 778
    - Norway 778
    - Sweden 779
    - Russia 781
  - Asia 786
    - Siberia 786
    - Japan 788
    - Corea 790
    - China 790
    - Cochin China 792
    - Burmah 793
    - India 793
    - Turkestan 796
    - Persia 797
    - Transcaucasia 798
    - Asia Minor 798

ical distribution—continued.

Page.
a. 799
a 799
uth Africa 799
gypt 800
ubia 802
byssinia 803
estern Africa and Algeria 803
islands 803
va. 803
umatra 805
orneo 806
alasia 807
ustralia 807
asmania 814
ew Zealand 815
ew Guinea 817
elen land 817
ra 818
Indies 819
America 820
hili 820
rgentine Republic 821
olivia 823
razil 823
uras 824
o 825
regions 826
ova Zembla 827
ear island 827
pitzbergen 827
eland 830
reenland 830
rinnell land 834
athurst island 834
elville island 835
ank's land 835
America 835
ackenzie river 835
ritish Columbia 836
ritish northwest territory 838
anada 842
ew Brunswick 845
rince Edward island 846
ova Scotia 847
ape Breton 848
ewfoundland 848
nited States 848
laska 924
on of the map 927

artment of the interior—U. S. geological survey | J. W. Powell, r | Summary | of the | geology of the quicksilver deposits | of acific slope | by | George F. Becker | Extract from the eighth report of the director, 1886–'87 | [Survey design] | hington | government printing office | 1889

cover with title as above; half title, "Summary of the geology of the ver deposits of the Pacific slope, by George F. Becker," p. 961, verso blank; and illustrations, p. 963, verso blank; text, pp. 965–985. Royal 8°. Plates LXIII. 110 copies.

CONTENTS.

- Statistics and history
- Foreign occurrences of quicksilver
- Lithological geology
  - Sedimentary rocks
  - Massive rocks
- Historical geology
- Descriptive geology
  - Deposits of the Pacific slope
    - Clear lake district
    - Sulphur bank
    - Knoxville district
    - New Idria district
    - New Almaden district
    - Steamboat springs
    - Oathill, Great eastern, and Great western districts
    - Other quicksilver deposits
- Generalizations
  - Discussion of the ore deposits
  - Solution and precipitation of cinnabar and other ores
  - Origin of the ore

Department of the interior—U. S. geological survey | J.
director | The geology | of the | island of mount Desert,
Nathaniel Southgate Shaler | Extract from the eighth ann
the director, 1886–'87 | [Survey design] |
Washington | government printing office | 1889

Paper cover with title as above; half-title, "The geology of the is
Desert, Maine, by Nathaniel Southgate Shaler," p. 987, verso blank; c
verso blank; illustrations, p. 991, verso blank; text, pp. 993–10
Plates LXIV–LXXVI; figs. 23–45. 110 copies.

CONTENTS.

- Introduction
- I. Surface and glacial geology
  - Description of the surface
  - Description of the superficial deposits
  - Glacial action
    - Direction of glacial movement
    - Glacial sculpture
    - Evidences of subsidence during and after the glacial period
      - First bench
      - Second bench
      - Third bench
      - Fourth bench
      - Fifth bench
      - Sixth bench
      - Seventh bench
      - Sea-worn cliffs
      - Evidences of benches above the level of 1,000 feet
      - Generalization of evidences from benches
      - Evidences from chasms
      - Evidences of subsidence from distribution of glacial waste
    - Conclusions respecting subsidence
- II. Structural geology
  - Prefatory
  - Granites of mount Desert
  - Stratified rocks of mount Desert
    - General statement
    - Bartlett's island series
    - Schooner head series
    - Sutton's island series

ogy—continued.

	Page.
ry island series	1043
oor series	1047
mount Desert	1052
dikes	1052
er's island dike	1052
s point	1053
er dikes	1053
porphyry masses	1054
kes	1055
d of the dikes	1056
s of white quartz	1057
hysical history of mount Desert rocks	1057
logic maps	1060
ce geology	1060
g bed rock geology	1060

NINTH ANNUAL REPORT, 1887-1888.

ress, | 2d session. | House of representatives. | Ex. doc.
Report | of the | secretary of the interior; | being part
age and documents | communicated to the | two houses of
the | beginning of the second session of the fiftieth con-
volumes. | Volume IV. |
n: | government printing office. | 1889.

with title as above; library catalogue slips (sample), verso blank,
nent of the publications of the survey, pp. i-iv; title as above, verso
le, "Ninth annual report of the director of the United States geo-
" p. iii, verso blank; contents, pp. v-viii; illustrations, pp. ix-xiii,
tter of transmittal to the secretary, p. 1, verso blank; text, pp. 3-712;
717. Royal 8°. Plates I-LXXXVIII; figs. 1-61.

CONTENTS.

	Page.
port of the director	3-46
, Administrative reports of	47-199
e Charleston earthquake of August 31, 1886	203-528
e geology of cape Ann, Massachusetts	529-611
rmation of travertine and siliceous sinter by the vegetation of hot springs	613-676
the geology and physiography of a portion of northwestern Colorado and f Utah and Wyoming	677-712

consisted of 1,734 copies, the "usual number," about 600 of which
unbound, as described above; the remainder were printed later and
, in which form they constitute vol. 13 of the "Executive documents
representatives for the second session of the fiftieth congress," and
s, as follows:

e | executive documents | of the | house of representatives | for the |
of the fiftieth congress. | 1888-'89. | Volume 13. |
| government printing office. | 1890.

50th congress, | 2d session. | House of representatives. | Ex. doc. 1, |
t | of the | secretary of the interior; | being part of | the message and
mmunicated to the | two houses of congress | at the | beginning of the
of the fiftieth congress | In six volumes. | Volume IV. |
| government printing office. | 1889.

inth annual report | of the | United States geological survey | to the |
e interior | 1887-'88 | by | J. W. Powell | director | [Survey de-

| government printing office | 1889

First title above, verso blank; second title above, verso blank; sa
catalogue slips, 1 p., verso blank; advertisement of the publications of
pp. i-iv; third title above, verso blank; half-title, contents, illustratio
the unbound quota. About 1,100 copies.

Another edition as follows:

Report | of the | secretary of the interior; | being part of
sage and documents | communicated to the | two houses of
at the | beginning of the second session of the fiftieth congre
volumes. | Volume IV. |
Washington: | government printing office. | 1889.

Collation precisely like that of the unbound quota of the previous edi
of course, that there is no paper cover, and the contents are the same.

This edition consisted of 3,000 copies; bound in black cloth. Anoth
follows:

Annual report | of the | secretary of the interior | for the |
ending June 30, 1888. | In six volumes. | Volume IV. |
Washington: | government printing office. | 1889.

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This edition consisted of 750 copies; bound in dark red cloth. Anoth
follows:

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the | secretary of the interior | 1887-'88 | by | J. W. Powell |
[Survey design] |
Washington | government printing office | 1889

Library catalogue slips (sample), verso blank, 1 l.; advertisement
cations of the survey, pp. i-iv; title as above, verso blank; half-title, "
report of the director of the United States geological survey," p. iii,
contents, pp. v-viii; illustrations, pp. ix-xiii; letter of transmittal to t
p. 1, verso blank; text, with half-titles, contents, etc., of individual p
712; index, pp. 713-717. Royal 8°. Plates I-LXXXVIII; figs. 1-61. C
the earlier editions.

This edition, ordered by concurrent resolution of the senate adopted
July 29, 1888, consisted of 15,500 copies; bound, as usual, in dark red c

The ninth annual is sold by the secretary of the interior, under author
resolution approved March 3, 1887, at the price of $1.50.

One hundred and ten copies of this report were divided into the sep
composing it and the separates issued with the following titles:

SEPARATES FROM THE NINTH ANNUAL.

Ninth annual report | of the | United States geological
the | secretary of the interior | 1887-'88 | by | J. W. Powell |
[Survey design] |
Washington | government printing office | 1889

Paper cover with title as above; inner title same, verso blank; half-
annual report of the director of the United States geological survey,"
blank; contents (of the whole volume), pp. v-viii; illustrations (of th
ume), pp. ix-xiii, verso blank; letter of transmittal of the volume to t
p. 1, verso blank; report of the director, pp. 3-46; half-title to admin
ports of chiefs, p. 47, verso blank; administrative reports of chiefs,
Royal 8°. Plates I-VI. 110 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

Page.
.... 1
hic work 3
work 7
vision 7
ean geology 8
vision 10
.... 11
sion 12
sion 13
n 14
n 15
division 15
mations 16
nic geology 17
.... 19
.... 21
ogic work 21
cialize 22
tion and classification 22
ntology 23
ontology 24
rate fossils 24
fishes 25
.... 26
.... 26
and technology 26
hysics 29
sion 30
y and documents 31
.... 31
veer Hayden 31
ing 38
.... 42
n 44

ADMINISTRATIVE REPORTS.

Gannett 49
Woodward 69
Shaler 71
ael Pumpelly 75
ilbert 76
an Hise 79
Chamberlin 84
Emmons 87
Hague 91
Dutton 96
iller 98
Becker 100
cGee 102
ohnson 110
eale 111
Marsh 114
Walcott 115
hite 120
Dall 123
F. Ward 128
Newberry 131
. Fontaine 132
el H. Scudder 133
T. Day 134
. Clarke 141
Holmes 143
arwin 145
). McChesney 152

Department of the interior—U. S. geological survey | J.
director | The Charleston earthquake | of | August 31, 1886
Clarence Edward Dutton | U. S. ordnance corps | Extrac
ninth annual report of the director, 1887–'88 | [Survey desi
Washington | government printing office | 1890

Paper cover with title as above; half-title, "The Charleston earthqu
31, 1886, by capt. Clarence Edward Dutton, U. S. ordnance corps,".
blank; contents, p. 205, verso blank; illustrations, pp. 207–208; preface
text, pp. 212–409; appendix: list of localities furnishing reports, pp. 41
8°. Plates VII–XXXI; figs. 1–41. 110 copies.

CONTENTS.

Preface ....
Accounts of the earthquake by persons who experienced it in Charleston: (1) Mr. Carl
(2) Dr. G. E. Manigault; (3) Mr. F. R. Fisher ....
General discussion of the effects of the earthquake. Detailed examination of these ef
Detailed study of the epicentral tracts ....
Computation of the depths of the foci ....
Summary view of the effects throughout the country at large ....
Discussion of the isoseismals, or lines of supposed equal intensity of the shocks ......
Discussion of the speed of propagation of the principal vibrations through the ground
On the nature and mechanism of wave motion through solid bodies ....

Department of the interior—U. S. geological survey | J.
director | The geology | of | cape Ann, Massachusetts | by
Southgate Shaler | Extract from the ninth annual report of t
1887–'88 | [Survey design] |
Washington | government printing office | 1890

Paper cover with title as above; half-title, "The geology of cape
chusetts, by Nathaniel Southgate Shaler," p. 529, verso blank; cont
verso blank; illustrations, pp. 533–535, verso blank; letter of transmit
rector, p. 537, verso blank; text, pp. 539–611. Royal 8°. Plates x
figs. 42–51. 110 copies.

CONTENTS.

Letter of transmittal ....
Nature and objects of report ....
General geographic and geologic relations of the cape Ann district ....
    General form of the cape Ann anticline ....
Nature and distribution of drift deposits ....
    Shoved moraines ....
    Form of drift deposits ....
        Serpent kames ....
        Drumlins ....
Composition and nature of glacial materials ....
    Decay of bowlders ....
Amount of erosion during the glacial period ....
    Glacial scratches ....
    Carriage of erratics ....
Post-glacial erosion on cape Ann ....
    Atmospheric erosion ....
    Marine erosion ....
        Sea beaches ....
        Effect of sea-weeds on movement of pebbles ....
        Rate of wear of pebbles ....
        Decay of rocks in place ....

Page.
el in cape Ann 567
nt subsidence 568
nt elevation 569
since glacial period 571
n district 574
.... 575
the bed rocks of cape Ann 576
racter of rocks 579
Ann district 579
f dikes 580
l by dikes 583
f cape Ann district 583
of cape Ann 589
rried rocks 602
graphy of cape Ann 605
l structure on health of district 610

of the interior—U. S. geological survey | J. W. Powell,
ormation | of | travertine and siliceous sinter | by the |
hot springs | by | Walter Harvey Weed | Extract from
al report of the director, 1887–'88 | [Survey design] |
| government printing office | 1890

h title as above; half-title, "Formation of travertine and siliceous
getation of hot springs, by Walter Harvey Weed," p. 613, verso
p. 615, verso blank; illustrations, p. 617, verso blank; text, pp.
. Plates LXXVIII–LXXXVII; figs. 52–56. 260 copies—110 regular
extras ordered by the author.

CONTENTS.

Page.
.... 619
s 619
ers 620
llowstone national park 628
.... 628
ns 629
ts 629
heir vegetation 630
e of the algæ 631
ment 633
vegetable growth 635
onate of lime 637
ot spring waters 638
bonate of lime 640
nate of lime due to plant life 642
deposits 645
travertine 649
ter 650
f the Firehole river 651
n 651
ot spring waters 654
eous sinter 655
of the hot waters 657
annels 658
of algous sinter 665
of siliceous sinter 666
nce 667
.... 667
.... 668
s sinter 669
New Zealand 672
.... 676

Department of the interior—U. S. geological survey | J. W. Powell, director | On the geology and physiography | of | a portion of northwestern Colorado and | adjacent parts of Utah and Wyoming | by | Charles A. White | Extract from the ninth annual report of the director, 1887–'88 | [Survey design] |
Washington | government printing office | 1890

Paper cover with title as above; half-title, "On the geology and physiography of a portion of northwestern Colorado and adjacent parts of Utah and Wyoming, by Charles A. White," p. 677, verso blank; contents, p. 679, verso blank; illustrations, p. 681, verso blank; text, pp. 683–712; index (to the whole volume), pp. 713–717. Royal 8°. Plate LXXXVIII; figs. 57–61. 110 copies.

CONTENTS.

	Page.
Topography of the district	683
Geological formations	685
Archean rocks	686
Uinta sandstone	687
Carboniferous	688
Jura-Trias	688
Cretaceous	689
The Dakota group	689
The Colorado group	689
The Fox hills group	689
The Laramie group	690
Tertiary	690
The Wasatch group	690
The Green river group	690
The Bridger group	690
The Brown's park group	691
Displacements	692
The Uinta fold	692
The Yampa plateau and other subordinate folds	697
Junction mountain upthrust	701
Yampa mountain upthrust	702
Relation of the Uinta fold to other folds and to the Park range uplift	703
Cañons traversing the upthrust and folds	706
The Uinta cañons of the Green river	707
Yampa mountain cañon	708
Junction mountain cañon	709
Yampa cañon	709
Concluding remarks	710

TENTH ANNUAL REPORT, 1888–1889.

51st congress, | 1st session. | House of representatives. | Ex. doc. 1, | part 5. | Report | of the | secretary of the interior; | being part of | the message and documents | communicated to the | two houses of congress | at the | beginning of the first session of the fifty-first congress. | In five volumes. | Volume IV—in two parts. | Part 1 [–2]. |
Washington: | government printing office. | 1890.

Two parts, bound as two volumes. Part I: paper cover with title as above; library catalogue slips (sample), verso blank, 1 l.; advertisement of the publications of the survey, pp. i–v, verso blank; title as above, verso blank; half-title, "Tenth annual report of the director of the United States geological survey, part I—geology," p. iii, verso blank; contents, pp. v–ix, verso blank; illustrations, pp. xi–xv, verso blank; letter of transmittal to the secretary, p. 1, verso blank; text, including half-titles, tables of contents, and lists of illustrations of individual papers, also plate designations and explanations, pp. 3–760; (there are no pp. 761, 762); errata, p. 763, verso

765–774. Plates I–XCVIII (I being a map in pocket); figs. 1–69. Part
vith title as above; inner title the same, verso blank; half-title,
port of the director of the United States geological survey, part II—
verso blank; contents, pp. v–vi; abstract, pp. vii–viii; text, pp.
; index, pp. 121–123. No illustrations. Royal 8°.

CONTENTS OF PART I.

Page.
t of the director 3–80
dministrative reports of 81–252
l account of the fresh-water morasses of the United States, with a de-
mal swamp district of Virginia and North Carolina 255–339
an Hise (C. R.), The Penokee iron-bearing series of Michigan and Wis-
.... 341–507
fauna of the lower Cambrian or Olenellus zone 509–760

CONTENTS OF PART II.

t VII
n survey 1
cretary of the interior to the president pro tempore of the senate 1
he acting commissioner of the general land office to the secretary of the
.... 3
he director of the United States geological survey to the secretary of the
.... 4
cretary of the interior to the president pro tempore of the senate 8
he director of the United States geological survey to the secretary of the
.... 9
etary of the interior to the president pro tempore of the senate 15
he director of the United States geological survey to the secretary of the
.... 15
the organization and prosecution of the survey of the arid lands for pur-
gation 16
x 17
tana 17
ada 18
rado 18
Mexico 19
.... 19
.... 22
s 22
ds 24
n of reservoir sites 26
rigable lands 27
y 29
.... 33
of operations 38
ations 40
.... 40
.... 40
.... 41
.... 41
California 42
.... 43
vey 45
ri division 45
sion 45
livision 46
n 46
ision 47
vision 47
n 48
.... 49
.... 58
ed 61
Thompson 65
of work 65
ion and personnel 66

Report of Prof. A. H. Thompson—continued.
- Detailed report by divisions
  - California and Nevada
  - Colorado
  - Montana
  - New Mexico
- Field methods
  - Character of work
  - Methods of control
  - Horizontal control
  - Vertical control
  - Control of representation
- Office work
  - Organization
  - California and Nevada
  - Colorado
  - Montana
  - New Mexico

Report of Capt. C. E. Dutton
- Hydrographic work
  - Stream gauging
  - Measurement of river flow
  - Meteorology
  - Evaporation
  - Suspended mattor
  - Topography of river channel
  - Arkansas river
  - Rio Grande
  - Gila and Salt rivers
  - Truckee and Carson rivers
  - Hydrographie work in Utah
  - Snake river
  - Yellowstone and upper Missouri
- General remarks on hydrographic work
  - Montana division
  - Arkansas division
  - Rio Grande division
  - California division
  - Lahontan division, in Nevada
  - Snake river division

Expenditures
- Classification of expenditures
- Abstract of disbursements

Index

(A preliminary report of the director of the geological survey, on
tion and prosecution of the survey of the arid lands for purposes of i
transmitted to the secretary of the interior December 31, 1888, and b
transmitted to the president pro tempore of the senate January 2,
before congress. It was printed as senate ex. doc. no. 43, 50th cong
12 pp. 8°; and it is reprinted on pp. 16–29 of part II of the tenth ann

This edition consisted of 1,734 copies, the "usual number," about 600
as described, the balance printed later and bound in sheep, in which
stitute vol. 14 (in two parts) of the "Executive documents of the ho
tatives for the first session of the fifty-first congress."

Another edition as follows:

Report | of the | secretary of the interior; | being part
sage and documents | communicated to the | two houses c
at the | beginning of the first session of the fifty-first cong
volumes. | Volume IV—in two parts. | Part 1 [–2]. |
Washington: | government printing office. | 1890.

arts collate as in the unbound quota of the previous edition, except that
paper covers, and their contents are the same.
on consisted of 3,000 copies; bound in black cloth. Another edition as

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0, 1889. | In five volumes. | Volume IV—in two parts. | Part

gton: | government printing office. | 1890.

bound as two volumes. Part I: title as above, verso blank; half-title,
l remainder of volume as described under previous editions. Part II:
e, verso blank; half-title, contents, and remainder of volume as described
us editions.
n consisted of 750 copies; bound in dark red cloth. Another edition as

nnual report | of the | United States geological survey | to
etary of the interior | 1888–'89 | by | J. W. Powell | direc-
—geology [—II—irrigation] | [Survey design] |
gton | government printing office | 1890

bound as two volumes. Part I: Sample library catalogue slips, verso
advertisement of the publications of the survey, pp. i–v, verso blank;
e, verso blank; half title, "Tenth annual report of the director of the
s geological survey, part I—geology," p. iii, verso blank; contents,
so blank; illustrations, pp. xi–xv, verso blank; letter of transmittal by
to the secretary of the interior, p. 1, verso blank; text, including half-
nts, etc., of individual papers, pp. 3–760; errata, p. 763 [sic], verso
x, pp. 765–774. Plates I–XCVIII (I being a map in pocket); figs. 1–69.
as above, verso blank; half title, "Tenth annual report of the director
States geological survey, part II—irrigation," p. iii, verso blank; con-
vi; abstract of this the first irrigation annual report, pp. vii–viii; text,
ndex, pp. 121–123. No illustrations. Royal 8°. Contents as in the
ns.
published of this edition, under resolution of the house concurred in
March 13, 1890, 15,500 copies; bound, as usual, in dark red cloth.
igation), being small and not illustrated, and needed for the immediate
and use of congress, was put in type and a few hundred copies delivered
some months in advance of the main portion of the edition. These
r covers, the main title being repeated on the front cover.
annual is sold by the secretary of the interior, under authority of a
ion approved March 3, 1887, at the price of $2.80 for both parts.
ed and ten copies of part I of this report were divided into the separate
osing it, and the separates issued with the following titles:

SEPARATES FROM THE TENTH ANNUAL.

nnual report | of the | United States geological survey | to
etary of the interior | 1888–'89 | by | J. W. Powell | direc-
—geology | [Survey design] |
gton | government printing office | 1890

r with title as above; inner title the same, verso blank; half-title,
ual report of the director of the United States geological survey, part
p. iii, verso blank; contents (of the whole volume), pp. v–ix, verso

blank; illustrations (of the whole volume), pp. xi–xv, verso blank; le
mittal of the volume to the secretary, p. 1, verso blank; report of the
3–80; half-title to administrative reports of chiefs, p. 81, verso blank
tive reports of chiefs, pp. 83–252. Royal 8°. 110 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

- Letter of transmittal
- Changes in organization
- Progress of topographic work
- Progress in geologic work
  - Work in geologic correlation
  - Work in Archean geology
  - Work on the Atlantic coast
  - Work in the Appalachian region
  - Work in the lake Superior division
  - Work in glacial geology
  - Work in Montana
  - Work in Yellowstone park
  - Work in Colorado
  - Work in California
  - Work of the Cascade division
  - Work of the Potomac division
- Progress in paleontologic work
  - Work on vertebrate fossils
  - Work in paleobotany
  - Work in Paleozoic invertebrate paleontology
  - Work in Mesozoic invertebrate paleontology
  - Work in Cenozoic invertebrate paleontology
  - Work on fossil insects
- Progress in accessory work
  - Work in chemistry and physics
  - Work in petrography
    - Processes
    - Rocks in general
    - Volcanic rocks
    - Metamorphic rocks
    - Sedimentary rocks
  - Work in mining statistics and technology
  - Work in mathematics
- Publications
  - Work in the division of illustrations
  - Work of the library
- Conference on map publication
  - The occasion for the conference
  - Circular letter
  - The work of the conference
  - Unit of publication
  - Nomenclature
  - Conventional symbols for geologic maps
  - The illustrative plates
  - Conventional symbols for geologic sections
- Disbursements
- Financial statement

ADMINISTRATIVE REPORTS.

- Report of Mr. Henry Gannett
  - Mr. R. S. Woodward
  - Mr. G. K. Gilbert
  - Mr. Raphael Pumpelly
  - Prof. N. S. Shaler
  - Mr. Bailey Willis
  - Prof. C. R. Van Hise
  - Dr. T. C. Chamberlin
  - Dr. A. C. Peale

ADMINISTRATIVE REPORTS—continued. Page.

d Hague.. 132
mmons.. 137
F. Becker... 141
iller.. 144
IcGee.. 148
Marsh.. 158
s D. Walcott.. 160
Vhite... 162
Dall... 166
F. Ward... 169
Scudder.. 176
. Clarke... 177
Day.. 182
Croffut... 189
Holmes... 189
s C. Darwin... 190
D. McChesney.. 199

of the interior—U. S. geological survey | J. W. Powell,
eral account | of the | fresh-water morasses of the United
a description of | the Dismal swamp district of Vir-
rth Carolina | by | Nathaniel Southgate Shaler | Extract
annual report of the director, 1888–'89 | [Survey design] |
| government printing office | 1890

ith title as above; half-title, "General account of the fresh-water
United States, with a description of the Dismal swamp district of
rth Carolina, by Nathaniel Southgate Shaler," p. 255, verso blank;
verso blank; illustrations, pp. 259–260; text, pp. 261–339. Royal 8°.
igs. 2–38. 110 copies.

CONTENTS. Page.

.... 261
.... 261
swamps.. 261
n of inundated lands based on physical characters.................... 263
ssification of inundated lands... 204
ps.. 271
n of inundated lands based on the character of the vegetation...... 282
plants on the formation of morasses....................................... 291
ps.. 291
cial action in perturbing drainage... 295
f morasses... 303
ed lands in the United States which are winnable to agricultural uses...... 310
oximate areas of inundated lands in the several states.................. 311
ismal swamp district of Virginia and North Carolina..................... 313
er of the beds below the level of the Dismal swamp..................... 315
ls found in beds exposed near Suffolk, Va................................. 315
the Dismal swamp... 317
er of the vegetation in the Dismal swamp.................................. 321
bench or elevated sea margin.. 326
changes in the continental level on the Dismal swamp district......... 328
e Dismal swamp.. 332
ing the Dismal swamp.. 334
f the Dismal swamp district.. 338

of the interior—U. S. geological survey | J. W. Powell,
| Penokee iron-bearing series | of | Michigan and Wis-
Roland Duer Irving | and | Charles Richard Van Hise |
the tenth annual report of the director, 1888–'89 | [Sur-

| government printing office | 1890

Paper cover with title as above; half-title, "The Penokee iron-bear
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p. 341, verso blank; contents, p. 343, verso blank; illustrations, pp. 34
pp. 347–464; half-title, "Plates," p. 465, verso blank; explanations of
468, 470, 472, and consecutive even pages (versos) to and including p. 50
in each case containing the word "Plate" and its number as a half-ti
XLII," p. 507, verso blank (being a map and requiring no separate e
Royal 8°. Plates XX–XLII; figs. 39–43. 110 copies.

CONTENTS.

Introduction..
Geological explorations and literature........................
The southern complex..
The cherty limestone member..
The quartz slate member..
The iron-bearing member..
  Details..
  Origin of the rocks of the iron-bearing member........................
  The Animikie iron-bearing series..
  The iron ores..
The upper slate member..
  Details..
  Origin of the upper slate rocks..
Eruptives..
The eastern area..
General geology..
  Flexures and faults..
  Structure..
  Correlation..

Department of the interior—U. S. geological survey | J.
director | The | fauna of the lower Cambrian | or | Olenellus z
Charles Doolittle Walcott | Extract from the tenth annual
the director, 1888–'89 | [Survey design] |
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Paper cover with title as above; half-title, "The fauna of the lower
Olenellus zone, by Charles D. Walcott," p. 509, verso blank; contents,
illustrations, pp. 513–514; text, pp. 515–658; half-title, "Plates," p. 659,
explanations of plates, pp. 662, 664, 666, and consecutive even pages (ve
including p. 760, the recto in each case containing the word "Plate," a
ber as a half-title; errata (for the whole volume), p. 763, verso blank; in
whole volume), pp. 765–774. Royal 8°. Plates XLIII–XCVIII; figs. 44–69.

CONTENTS.

I. Definition of title..
II. Scope of paper..
III. List, by authors, of books and papers..
    Chronologic arrangement of the preceding list by authors........................
IV. Historical review..
    North America..
      Geologic investigation..
        Newfoundland..
        New Brunswick..
        Vermont..
        New York and Massachusetts..
        Appalachian area south of New York..
        Massachusetts..
        Rocky mountain province..
      Paleontologic investigation..
    Europe..

Page.
mbrian or Olenellus Zone, as known to the geologist 547
ocality of Cambrian group 547
showing classification of Paleozoic and subjacent strata 547
showing classification of the Cambrian group 548
of the Olenellus zone 549
ureka section of Nevada 549
asatch section of Utah 549
ount Stephen section of British Columbia 550
rand cañon section of Arizona 550
astern New York section 552
ermont section 552
ewfoundland section 554
ine of demarkation between Cambrian and pre-Cambrian 555
American continent during Cambrian time 556
of the Olenellus fauna 556
ent of Europe during the deposition of the sediment now forming the Ole-
zone 562
distribution 564
coast province 564
ain-Hudson province 568
ountain province 570
f the geographic distribution of the lower Cambrian fauna in North America. 572
tion in Europe 577
dinavia 577
sia 579
in 580
ain 580
nce 581
the lower Cambrian to the superjacent faunas 581
l or stratigraphic relations 582
al relations 583
York and Vermont 583
ky mountain province 584
foundland 585
ns of the genera and species 586
æ 586
ngiæ 587
rozoa 587
inozoa 587
inodermata 588
elida, etc 588
chiopoda 588
ellibranchiata 589
teropoda 589
ropoda 590
stacea 590
obita 590
ison of the faunas as a whole 593
f fauna 594
ison and correlation 595
e genera and species 597
e 507
oa 599
burrows, and tracks 602
oa 604
ermata 607
poda 607
branchiata 614
oda 616
da 620
ea 625
a 629

ELEVENTH ANNUAL REPORT, 1889–1890.

51st congress, | 2d session. | House of representatives. | E
part 5. | Report | of the | secretary of the interior; | being p
message and documents | communicated to the | two hous
gress | at the | beginning of the second session of the fift
gress. | In five volumes. | Volume IV—in two parts. | Part 1
Washington: | government printing office. | 1890.

Two parts, to be issued as two volumes. At this writing part I has n
the preparation of some of the illustrations having delayed it. The a
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title the same, verso blank; half-title, "Eleventh annual report of th
the United States geological survey, part II—irrigation," p. iii, verso
tents, pp. v–vii, verso blank; illustrations, p. ix, verso blank; abst
report, pp. xi–xiv; text, pp. 1–388; index, pp. 389–395. Royal 8°. Plates
figs. 121–124.

CONTENTS OF PART I.

Powell (J. W.), Report of the director ....
Chiefs of divisons; Administrative reports of ....
McGee (W J), The Pleistocene history of northeastern Iowa ....
Phinney (A. J.), The natural gas field of Indiana ....

CONTENTS OF PART II.

HYDROGRAPHY.

Outline of this report ....
Scope of work ....
Units of measurement ....
Stream measurements ....
    Current meters ....
    Rating the meter ....
    River stations ....
    Equipment of station ....
    Diurnal variation ....
    Rating the station ....
Rainfall ....
Evaporation ....
Hydrography of the drainage basins ....
    Yellowstone basin ....
    Upper Missouri basin ....
    The Missouri river ....
    The Sun river ....
    Cache la poudre basin ....
    The Arkansas basin ....
    Rio Grande basin ....
    Gila basin ....
    Truckee and Carson basins ....
    Salt lake basin ....
    Snake river basin ....
Tables of monthly discharges ....
Tables of gaugings at temporary stations ....

ENGINEERING.

Scope of work ....
Montana division ....
    The Sun river surveys ....
Arkansas division ....
    Twin lake reservoir ....
Rio Grande division ....

Page.
.... 150
survey 150
.... 168
.... 183
.... 184
on 190
.... 194

THE ARID LANDS.

irector of the U. S. geological survey to the house committee on irrigation 203
the constitutions of states, relating to irrigation 240
ation on the Great plains 260
nsiderations affecting artesian water supply 260
limit to utilization of artesian water for irrigation 263
by artesian wells in various countries 265
onditions and statistics of artesian wells on the Great plains 266
and conclusions 275

TOPOGRAPHY.

ompson, geographer 293
tion of work 293
ization and personnel 293
f divisions 294
-Nevada 294
.... 299
.... 302
.... 305
co 306
.... 309
.... 310
.... 310
he work 310
ol 311
.... 311
.... 312
money 312

BIBLIOGRAPHY.

re 345
.... 389

consists of 1,734 copies, the "usual number," about 600 in paper
ribed, the balance printed later and bound in sheep, in which form
, part 1 vol. 14 and part 2 vol. 15 of the "Executive documents of
epresentatives for the second session of the fifty-first congress."
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nnual report | of the | United States geological survey |
etary of the interior | 1889–'90 | by | J. W. Powell | direc-
-geology [-II—irrigation] | [Survey design] |
on | government printing office | 1891

ound as two volumes. Part I: sample library catalogue slips, verso
dvertisement of the publications of the survey, pp. i–v, verso blank;
verso blank; half-title, "Eleventh annual report of the director of
tes geological survey, part I—geology," p. iii, verso blank; contents,
rations, pp. xi–xv, verso blank; letter of transmittal, p. [1], verso
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ates I–LXVI; figs. 1–120. Part II: title as above, verso blank; half-
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rigation," p. iii, verso blank; contents, pp. v–vii, verso blank; illus-
, verso blank; abstract of this report, pp. xi–xiv; text, with half-

titles to individual papers, pp. 1-388; index, pp. 389-395. Royal 8°. Pl
xcvi; figs. 121-124.

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trations causing delay, but I have seen a copy in unbound form and fr
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Eleventh annual report | of the | United States geological
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Washington | government printing office | 1891

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part I—geology," p. iii, verso blank; contents (of the whole volume), pp
trations (of the whole volume), pp. xi-xv, verso blank; letter of transm
secretary, p. [1], verso blank; report of the director, pp. 3-30; half-titl
istrative reports of chiefs, p. 31, verso blank; administrative reports of
33-185. Royal 8°. The "map showing progress of the topographic sur
I) is not with the separate. 110 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

Letter of transmittal ....
Changes in organization ....
Progress of topographic work for geologic purposes ....
Engraving ....
Progress in geologic work ....
Progress in paleontologic work ....
Progress in accessory work ....
  Chemistry and physics ....
  Mathematics ....
  Statistics of mineral products ....
  Publications ....
  Illustrations ....
  Organization of the engraving division ....
  The library ....
  Disbursements ....
    Financial statement ....
Accompanying papers ....
Offices and laboratories ....
Acknowledgments ....

ADMINISTRATIVE REPORTS.

Report of Mr. Henry Gannett ....
  Mr. G. K. Gilbert ....
  Prof. N. S. Shaler ....
  Prof. R. Pumpelly ....
  Mr. W J McGee ....
  Mr. Bailey Willis ....
  President T. C. Chamberlin ....
  Prof. C. R. Van Hise ....
  Dr. W. P. Jenney ....
  Dr. A. C. Peale ....
  Mr. Arnold Hague ....
  Mr. S. F. Emmons ....
  Mr. J. S. Diller ....
  Dr. G. F. Becker ....
  Mr. Alpheus Hyatt ....
  Prof. O. C. Marsh ....
  Mr. Charles D. Walcott ....

Page.
C. A. White ... 107
W. H. Dall ... 109
Lester F. Ward ... 114
f. Samuel H. Scudder ... 123
f. F. W. Clarke ... 125
R. S. Woodward ... 128
David T. Day ... 130
W. A. Croffut ... 131
DeLancey W. Gill ... 133
S. J. Kübel ... 134
Charles C. Darwin ... 137
John D. McChesney ... 140

nent of the interior—U. S. geological survey | J. W. Powell,
The Pleistocene history of northeastern Iowa. | By | W J
Extract from the eleventh annual report of the director,
[Survey design] |
gton | government printing office | 1891

er bearing title as above; no inner title; half-title, "The Pleistocene northeastern Iowa, by W J McGee," p. 189, verso blank; contents, pp. ustrations, pp. 193–197, verso blank; text, pp. 199–577; index (to the ne), pp. 743–757. Royal 8°. Plates II–XXI, XXIV–XXIX, XXXI–XLII, XLV– XXIII, XXX, XLIII, and XLIV—all being maps in pocket—are lacking, ompleted when the separates were issued; but it is the intention of the rward to recipients of the separates these five maps when they are com- s. 1–120. 110 copies, 60 of which the author had bound in dark red cloth.

CONTENTS.

Page.
... 199
rtheastern Iowa ... 202
rinciples and definitions ... 238
General statement ... 238
. Diastatic geology ... 242
I. Geomorphic geology ... 244
ry classification ... 244
w of land profiles ... 247
hioned land forms ... 249
terraces ... 256
nalysis of terraces ... 256
e formation of river terraces ... 259
. Stratic geology ... 273
The products of rock decay ... 275
. Glacial geology ... 280
l deposits in general ... 280
ess ... 291
e general features of the loess ... 291
e specific features of the loess ... 296
The indurated rocks ... 304
The formations and terranes ... 304
ockville conglomerate ... 304
al measures ... 308
b-carboniferous formations ... 312
e St. Louis limestone ... 312
e Keokuk limestone ... 312
e Burlington limestone ... 312
e Kinderhook limestone ... 313
evonian formations ... 314
e Hackberry shale ... 314
e Cedar valley limestone ... 314
e Independence shale ... 320
iagara limestone ... 323

Chapter III.—The indurated rocks—continued. Page.

Section I. The formation and terranes—continued.

- The Maquoketa shale 326
- The Galena limestone 327
- The Trenton limestone and shale 329
- The St. Peter sandstone 330
- The Oneota limestone 331
- The Potsdam sandstone 333
- Résumé 334

Section II. The deformations 336
- The types of deformation 336
- The general inclination 336
- The irregular deformations 337
- The regular deformations 338

Section III. The Paleozoic history 347

Section IV. The ante-Pleistocene surface 353
- The driftless area 353
- The drift-border area 355
- The drift-covered area 355

Chapter IV. Topography 358
- Section I. The drainage 358
- Section II. The general relief 363
- Section III. The local relief 367
  - The topographic areas 367
  - The driftless area 367
  - The drift-border area 382
  - The drift plain 393
  - The ridged-drift area 396
  - The loess-drift area 411
  - The Gumbo area 414
- Section IV. Résumé 415

Chapter V. The post-glacial phenomena 417
- Section I. Alluvium 417
- Section II. The river terraces 425
- Section III. Relations between alluvium and terraces 432

Chapter VI. The loess 435
- Section I. The loess of the northern area 435
- Section II. The loess of the river ridges and paha 450
- Section III. The southern loess 461

Chapter VII. The drift 472
- Section I. The upper till 472
- Section II. The forest bed 486
- Section III. The lower till 896
- Section IV. The glacial talus 510
- Section V. Representative well sections 514
- Section VI. Résumé 540

Chapter VIII. The ice markings 543
- Section I. The glacial striæ 543
- Section II. The rock molding 544
- Section III. The surface molding 545

Chapter IX. The residuary products 548
- Section I. The geest of the driftless area 548
- Section II. The history recorded in the residuary products 561

Chapter X. The glacial history 567

Department of the interior—U. S. geological survey | J. W. Powell, director | The natural gas field of Indiana. | By | Arthur John Phinney. | Extract from the eleventh annual report of the director, 1889–'90 | [Survey design] |

Washington | government printing office | 1891

Paper cover bearing title as above; no inner title; half title, "The natural gas field of Indiana, by Arthur John Phinney," p. 579, verso blank; contents, pp. 581–583, verso blank; illustrations, p. 585, verso blank; letter of transmittal to the director by W J McGee, geologist in charge, pp. 587–588; introduction, by W J McGee, pp. 589–616; text, pp. 617–742. Royal 8°. Plates LXII–LXVI. 110 copies.

CONTENTS.

Page.
nittal 587
y W J McGee. Rock gas and related bitumens 589
The conquest of the bitumens 589
The constitution of the bitumens 592
The distribution of the bitumens 594
remarks 594
deposits 595
cene 595
y 596
ous 597
rias 598
ferous 598
an 599
.... 600
rian and eruptive 600
.... 601
The natural storage of the lighter bitumens 603
The origin of rock gas and related bitumens 607
The future of rock gas and its allies 614
field of Indiana, by A. J. Phinney 617
he investigation 617
c map 620
gments 621
ologic structure of Indiana 623
General structure 623
Stratigraphy 624
section of the rocks of Indiana 624
er Magnesian limestone 625
Peter sandstone 625
nton limestone 627
ca shale 629
dson river group 630
nton and Medina 631
gara 632
er Helderberg and Waterlime 633
noharie 634
per Helderberg 635
milton limestone and shale 636
wn shale 637
ck shale 637
verly, or Knobstone 638
okuk, St. Louis, and Chester 638
l measures 639
ft 639
aphy of the rock surface 642
The altitude of the strata 643
cinnati arch 643
ography of the Trenton in Indiana 648
pothetic Wabash arch 651
nditions of gas accumulation 654
Conditions of rock structure 654
Conditions of rock texture 657
s pressure and its measurements 662
Definitions 662
The static pressure 663
The open pressure 666
The retained pressure 669
The measurement of gas wells 671
e gas field and the borings within it 676
The area yielding gas and oil 676
Records of borings within this area 678
ords of borings outside of the gas field 720
e care of gas wells 741

TWELFTH ANNUAL REPORT, 1890-1891.

52d congress, | 1st session. | House of representatives. | Ex. doc. 1, | part 5. | Report | of the | secretary of the interior; | being part of | the message and documents | communicated to the | two houses of congress | at the | beginning of the first session of the fifty-second congress. | In five volumes. | Volume IV—in two parts. | Part 1 [-2]. |
Washington: | government printing office. | 1892.

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CONTENTS OF PART I.

	Page.
Powell (J. W.), Report of the director	3-19
Chiefs of divisions, Administrative reports of	21-210
Shaler (N. S.), The origin and nature of soils	213-345
McGee (W J), The Lafayette formation	347-521
Walcott (C. D.), The North American continent during Cambrian time	523-568
Iddings (J. P.), The eruptive rocks of Electric peak and Sepulchre mountain, Yellowstone national park	569-664

CONTENTS OF PART II.

Thompson (A. H.), Report upon the location and survey of reservoir sites during the fiscal year ended June 30, 1891	1-212
Newell (F. H.), Hydrography of the arid regions	213-361
Wilson (H. M.), Irrigation in India	363-561

This edition consists of 1,734 copies, the "usual number," about 600 in paper covers, as described, the balance printed later and bound in sheep, in which form they constitute, part 1 vol. 17 and part 2 vol. 18 of the "Executive documents of the house of representatives for the first session of the fifty-second congress."

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Twelfth annual report | of the | United States geological survey | to the | secretary of the interior | 1890-'91 | by | J. W. Powell | director | Part I—geology [-II—irrigation] | [Survey design] |
Washington | government printing office | 1891

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ations causing delay, but I have seen a copy in unbound form and from
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d and ten copies of both parts of this report were divided into the sep-
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ary of the interior | 1890–'91 | by | J. W. Powell | director |
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ton | government printing office | 1891

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gy," p. iii, verso blank; contents (of the whole volume), pp. v–viii;
(of the whole volume), pp. ix–xiii, verso blank; letter of transmittal
ry, p. 1, verso blank; report of the director, pp. 3–19, verso blank;
dministrative reports of chiefs, p. 21, verso blank; administrative
iefs, pp. 23–210. Royal 8°. The "map showing the progress of the
survey" (plate I) is not with the separate. 110 copies.

CONTENTS.

REPORT OF THE DIRECTOR.

Page.
ittal 1
graphic work 3
.... 5
.... 5
east of the one hundredth meridian 5
west of the one hundredth meridian 6
.... 7
ogic work 8
ontologic work 9
essory work 13
nd physics 13
mineral products 14
.... 16
nd printing 16
.... 17
.... 17
nts 18
gments 19

ADMINISTRATIVE REPORTS.

enry Gannett 23
. H. Thompson 42
. K. Gilbert 52
N. S. Shaler 66
aphael Pumpelly 67
J McGee 70
ailey Willis 78
eorge H. Eldridge 82
C. R. Van Hise 84
C. Chamberlin 88
. P. Jenney 90
. C. Peale 91
rnold Hague 92
F. Emmons 96
S. Diller 100
. F. Becker 104
. D. Walcott 106

ADMINISTRATIVE REPORTS—continued.

Report of Prof. Alpheus Hyatt
- Mr. C. A. White
- Mr. W. H. Dall
- Prof. O. C. Marsh
- Mr. Lester F. Ward
- Prof. Samuel H. Scudder
- Mr. F. W. Clarke
- Mr. David T. Day
- Mr. F. H. Newell
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Department of the interior—U. S. geological survey | J.
director | The | origin and nature of soils | by | Nathaniel
Shaler | Extract from the twelfth annual report of the direct
| [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; half-title, "The origin and natu
Nathaniel Southgate Shaler," p. 213, verso blank; contents, p. 215
illustrations, pp. 217-218; text, pp. 219-345. Royal 8°. Plates II-XX
110 copies.

CONTENTS.

Prefatory note
Nature and origin of soils
Process of soil formation
- Cliff talus soils
- Glaciated soils
- Volcanic soils
- Soils of newly elevated ocean bottoms

Physiology of soils
- Effect of animals and plants on soils
- Effect of certain geologic conditions on soils
  - Glacial aggregation
  - Alluvial aggregation
  - Overplacement
  - Inheritance

Certain peculiar soil conditions
- Swamp soils
- Marine marshes
- Tule lands
- Ancient soils
- Prairie soils
- Wind-blown soils

Action and reaction of man and the soil
- Effects of soil on health
- Man's duty to the earth

Department of the interior—U. S. geological survey | J.
director | The | Lafayette formation | by | W J McGee | E
the twelfth annual report of the director, 1890-'91 | [Surve
Washington | government printing office | 1892

Paper cover bearing title as above; half-title, "The Lafayette for
J McGee," p. 347, verso blank; contents, p. 349, verso blank; illustrat
352; text, pp. 353-521. Royal 8°. Plates XXXII-XLI; figs. 28-72. 110

CONTENTS.

Page.
occupied by the formation 353
ic provinces 353
n of the coastal plain 360
logy of the coastal plain 380
of classification 380
ia formation 384
ulf formation 408
ake formation 410
rg-Jackson limestone 412
e-Meridian 413
deposits 415
key formation 418
retaceous 419
formation 421
c and Tuskaloosa formations 421
.... 424
ures of the formation 430
letail 430
ures 489
ion and synonymy of the formation 497
.... 497
.... 498
l resources of the formation 503
vey 503
.... 503
.... 505
.... 506
.... 506
ory recorded in the formation 507
physiography 507
eposition 508
egradation 511
e Lafayette 514
the continent movements 515

of the interior—U. S. geological survey | J. W. Powell,
| North American continent | during | Cambrian time |
D. Walcott | Extract from the twelfth annual report of
1890-'91 | [Survey design] |
n | government printing office | 1892

earing title as above; half-title, "The North American continent
n time, by Charles D. Walcott," p. 523, verso blank; contents, p.
; illustrations, p. 527, verso blank; text, pp. 529-568. Royal 8°.
; figs. 73-78. 110 copies.

CONTENTS.

Page.
ations 529
nts 532
tent of the sediments 535
.... 540
rovince 541
vince 542
. province 543
ntal province 543
.... 543
ribution 545
re-Cambrian land 546
st province 546
n province 548
tain province 551
tinental province 554

Pre-Cambrian land—continued. Page.
- Continental features 557
    - Dana 557
    - Chamberlin 561
    - Walcott 562
- Middle Cambrian land 563
- Post-Cambrian land 565
- Conclusions 567

Department of the interior—U. S. geological survey | J. W. Powell, director | The eruptive rocks | of | Electric peak and Sepulchre mountain | Yellowstone national park | by | Joseph Paxson Iddings | Extract from the twelfth annual report of the director, 1890–'91 | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; half-title, "The eruptive rocks of Electric peak and Sepulchre mountain, Yellowstone national park, by Joseph Paxson Iddings," p. 569, verso blank; contents, p. 571, verso blank; illustrations, p. 573, verso blank; tables, p. 575, verso blank; text, pp. 577–664. Royal 8°. Plates XLVI–LIII; figs. 79–81. 260 copies—110 regular issue and 150 additional ordered by the author.

CONTENTS.

Page.
- Introduction 577
- Geological sketch of the region 578
- Electric peak 579
    - Geological description 579
        - Geological map 581
    - The eruptive rocks of Electric peak 582
        - Use of the terms porphyrite and porphyry 582
        - Sheet rocks 584
        - Dike and stock rocks 586
            - The dike rocks and certain contact facies of the stock 588
            - The stock rocks and apophyses 595
            - Intergrowth of hornblende and pyroxene in glassy rocks 610
            - Quartz-mica-diorite-porphyrite 617
        - General consideration of the mineral and chemical composition of the rocks 619
- Sepulchre mountain 633
    - Geological description 633
    - The volcanic rocks of Sepulchre mountain 634
        - The lower breccia 634
        - The upper breccia 635
        - The dike rocks 640
        - General consideration of the mineral and chemical composition of the rocks 647
- Comparison of the rocks from the two localities 650
    - Correlation of the rocks on a chemical basis 652
    - Effect of mineralizing agents 658
    - Application to the classification of igneous rocks 660
- Appendix 664

Department of the interior—U. S. geological survey | J. W. Powell, director | Report | upon the | location and survey of reservoir sites | during the | fiscal year ended June 30, 1891 | by | A. H. Thompson | chief of western division of topography | Extract from the twelfth annual report of the director, 1890–'91 | [Survey design] |
Washington | government printing office | 1892

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CONTENTS.

Page.
ion 9
.... 10
.... 55
.... 127
ico 165
.... 209

**artment of the interior—U. S. geological survey | J. W. Powell, r | Hydrography | of | the arid regions | by | F. H. Newell | t from the twelfth annual report of the director, 1890-'91 | [Sur sign] |
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cover bearing title as above; half-title, "Hydrography of the arid regions. . Newell," p. 213, verso blank; contents, pp. 215-216; illustrations, pp. 217- t, pp. 219-361. Royal 8°. Plates LVIII-CVI; figs. 223-229. 110 copies.

CONTENTS.

Page.
phic measurements and irrigation 219
regions 219
phic data 221
of water 221
f water duty 223
rage 224
mount of flood waters 227
oods 228
of floods 230
nd river flow 230
maximum utility 231
ion of drainage basins 232
and irrigation 234
on observations 234
stream measurements 235
ssouri and Yellowstone basins 236
in 238
basin 240
le basin 240
raphy and elevations 240
al and monthly rainfall 243
olorado district of the Rio Grande 245
n Luis valley 247
rigation practice 248
district of the Rio Grande 251
ras mesa 256
anging station 257
valley 258
a district 261
listrict 269
que district 270
s below the Chama 273
Fe and adjacent streams 273
river 274
river 275
né of water supply 277
g the Rio Grande 278
lley 279
lains district 281
r 282
al topography 282
e and water supply 283
tributaries 284
tributaries in New Mexico 286

Pecos river—continued.

Agriculture along the Pecos
Irrigation works on the Pecos
Colorado river drainage basin
The Gila basin
Topography and altitudes
Agricultural lands
Duty of water
Water storage
Rainfall
Upper Gila district
San Pedro district
Middle Gila district
Verde district
Upper Salt district
Lower Salt district
Lower Gila district
Agua Fria and Hassayampa districts
Santa Cruz district
Sacramento and San Joaquin basins
Kern river
Tule river
Kaweah river
Kings river
San Joaquin river
Merced river
Tuolumne river
Mokelumne river
Lower San Joaquin river
The Great basin
Truckee river
Carson river
Salt Lake basin
Bear river
Bear lake
Lower Bear river
Cache valley
Ogden and Weber rivers
Utah lake drainage
Sevier river
Snake river drainage
Discharge tables

Department of the interior—U. S. geological survey | J.
director | Irrigation in India | by | Herbert M. Wilson, c.
from the twelfth annual report of the director, 1890–'91 |
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M. Wilson, c. e.," p. 363, verso blank; contents, pp. 365-366; illustra
368; preface, introduction, and text, pp. 369-561; financial stateme
appropriated and expended for the irrigation branch of the survey for
1890-'91), pp. 562-568. Royal 8°. Plates CVII-CXLVI; figs. 230-270.

CONTENTS.

Preface
Author's list
Introduction
Chapter I.—Finance and statistics
Value and necessity of irrigation
Land and crops

Page
aphy, meteorology, and forestry 399
geology 399
.... 403
.... 404
ry and administration 406
ation works 406
and legislation 407
and inundation canals 415
.... 415
ion 416
gricultural results 417
igation 419
.... 423
ls 425
and perennial canals 428
.... 428
evaporation 428
.... 435
.... 438
.... 439
anal 443
.... 445
.... 447
estern Jumna canals 450
.... 451
.... 452
pe, and alignment 455
.... 458
.... 460
.... 467
.... 473
s 477
.... 479
.... 481
.... 484
.... 490
ying water 495
ge works 498
.... 498
.... 503
ct 504
.... 506
ct 515
t 520
oir 525
.... 527
and cost 530
.... 536
.... 544
.... 545
.... 550
ge and canal systems 553
system 554
irrigation scheme 556
cy 557
n 561

MONOGRAPHS.

MONOGRAPH I.

tle: Department of the interior | Monographs | of the |
es geological survey | Volume I | [Seal of the department
or] |
on | government printing office | 1890

e: United States geological survey | J. W. Powell, direc-
nneville | by | Grove Karl Gilbert | [Survey design] |
on | government printing office | 1890

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rvey, pp. i–iv; general title as given above, verso blank; special title
e, verso blank; contents, pp. v–ix, verso blank; illustrations, pp.
blank; letter of transmittal to the director, p. xv, verso blank; pre-
xviii; abstract of volume, pp. xix–xx; text, pp. 1–402; half-title for
403, verso blank; appendixes, pp. 405–426; index, pp. 427–438. 4°.
s. 1–51; folded map, in cover pocket.

CONTENTS OF MONOGRAPH I.

Page.
tal XV
.... XVII
e XIX
DUCTION 1
.... 2
in 5
estigation 12
basin 20
omenclature 22
TOPOGRAPHIC FEATURES OF LAKE SHORES 23
.... 29
osion 29
a cliff 34
ave-cut terrace 35
ansportation 37
ach 39
rrier 40
baqueous ridge 43
position 46
ments 46
it 47
r 48
ok 52
op 55
ave-built terrace 55
terrace and v-bar 57
sand; dunes 59
on of wave-wrought shore features 60

Chapter II.—continued. Page.

- Stream work; the delta ... 65
- Ice work; the rampart ... 71
- Submergence and emergence ... 72
- The discrimination of shore features ... 74
  - Cliffs ... 75
    - The cliff of differential degradation ... 75
    - The stream cliff ... 75
    - The coulée edge ... 76
    - The fault scarp ... 76
    - The land-slip cliff ... 77
    - Comparison ... 77
  - Terraces ... 78
    - The terrace by differential degradation ... 78
    - The stream terrace ... 79
    - The moraine terrace ... 81
    - The fault terrace ... 83
    - The land-slip terrace ... 83
    - Comparison ... 84
  - Ridges ... 86
    - The moraine ... 86
    - The osar or kame ... 87
    - Comparison ... 87
- The recognition of ancient shores ... 88

Chapter III.—Shores of lake Bonneville ... 90
- The Bonneville shore-line ... 93
  - The question of a higher shore-line ... 94
  - More ancient lakes ... 98
  - Outline of the lake ... 101
  - Extent of the lake ... 105
  - Shore details ... 106
  - Embankment series ... 111
  - Determination of still-water level ... 122
  - Depth ... 125
  - The map ... 125
- The Provo shore-line ... 126
  - Outline and extent ... 127
  - Shore characters ... 128
    - Deltas ... 129
    - The underscore ... 130
  - Embankment series ... 131
  - The map ... 134
- The Stansbury shore-line ... 134
- The intermediate shore-lines ... 135
  - Description of embankments ... 135
    - Grantsville ... 135
    - Preuss valley ... 136
    - The snow-plow ... 137
    - Stockton and Wellsville ... 137
    - Dove creek ... 137
  - Comparison of embankments ... 137
  - Hypothesis of differential displacement ... 140
  - Hypothesis of oscillating water surface ... 141
    - Superposition of embankments ... 147
      - The snow-plow ... 147
      - Reservoir butte ... 148
      - Stockton ... 149
      - Blacksmith's fork ... 151
      - Dove creek ... 151
      - Double series in Preuss valley ... 152
- Deltas ... 153
    - American fork delta ... 155
    - Logan delta ... 159
    - Summary ... 166
- Tufa ... 167
- Résumé ... 169

Page.
THE OUTLET 171
d rock pass 173
rsh valley 176
e river 176
e gate of Bear river 178
e question of an earlier discharge 180
d river bed 181
ncient rivers 184
s and shore-lines 186
HE BONNEVILLE BEDS 188
river bed section 189
gton section 192
river bed section 194
llow clay 194
st gravel 194
hite marl 195
wer sand 195
ond gravel 195
per sand 196
per gravel 196
s of water level 196
of the first maximum 199
ness of the white marl 200
of material 203
sition of lake water 204
periments 205
tion by desiccation 208
mains 209
ture 211
THE HISTORY OF THE BONNEVILLE BASIN 214
nneville history 214
al cones and aridity 220
onneville history 222
ision of the basin 222
valley salt marsh 223
lake 224
t bed 225
ake 228
salt lake 230
rveys 230
pth 230
uging 230
cillations since 1875 233
cillations prior to 1875 239
anges in area 243
uses of change 244
ture changes 250
line contents 251
urces of saline matter 254
te and period of salt accumulation 255
una 258
l history of the Bonneville oscillations 259
raphic interpretation of lake oscillations 262
drographic hypothesis 263
ogenic hypothesis 263
eirogenic hypothesis 264
ic interpretation of lake oscillations 265
ns on correlation with glaciation 265
gument from analogy 269
cency 269
isodal character 269
partition 270
netic correlation 275
fect of a change in solar energy 283
idence from molluscan life 297

Chapter VI.—continued. Page.
    Depauperation and cold 300
    Depauperation and salinity 301
  The evidence from vertebrate life 303
  The evidence from encroaching moraines 305
    Wasatch-Bonneville moraines 306
    Sierra-Mono moraines 311
Summary of chapter 316
Chapter VII.—Lake Bonneville and volcanic eruption 319
  Ice spring craters and lava field 320
  Pavant butte 325
  Tabernacle crater and lava field 329
  Pleistocene winds 332
  Fumarole butte and lava field 332
  Other localities of basalt 335
  Pleistocene eruptions elsewhere 336
  Rhyolite 337
  Summary and conclusions 338
Chapter VIII.—Lake Bonneville and diastrophism 340
 Evidence from faulting; fault scarps 340
  General features of fault scarps 354
  Local displacements versus local loading and unloading 357
  Mountain growth 359
  Earthquakes 360
 Evidence from shore-lines 363
  Measurements 363
  Deformation of the Bonneville shore-line 365
  Deformation of the Provo shore-line 371
  Deformation during the Provo epoch 373
  Postulate as to the cause of deformation 373
  Hypothesis of geoidal deformation 376
  Hypothesis of expansion from warming 377
  Hypothesis of terrestrial deformation by loading and unloading 379
 Evidence from the position of Great salt lake 384
 The strength of the earth 387
Chapter IX.—The age of the equus fauna 393
  The fauna and its physical relations 393
  The paleontologic evidence 397
Appendix A.—Altitudes and their determination. By Albert L. Webster 405
  Scheme of tables 405
  Trigonometric data 406
  Barometric data 406
  Lake records 409
  Railroad records 411
  Special spirit-level determinations 411
  Combination of data 413
  Altitudes of shore-lines and their differences 416
Appendix B.—On the deformation of the geoid by the removal, through evaporation, of the water of Lake Bonneville. By R. S. Woodward 431
Appendix C.—On the elevation of the surface of the Bonneville basin by expansion due to change of climate. By R. S. Woodward 425
Index 427

3,000 copies; bound in dark maroon cloth. Sold by the director of the U. S. geological survey at $1.50 per copy, its actual cost as computed by the public printer.

Documentary edition as follows:

51st congress, | 1st session. | House of representatives. | Mis. doc. | no. 194. | Department of the interior | Monographs | of the | United States geological survey | Volume I | [Seal of the department of the interior] |

Washington | government printing office | 1890

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he "usual number" edition; published under authority of a joint ved July 7, 1882. Of these, a portion were delivered in paper covers, e remainder were bound in sheep, in which form they constitute Miscellaneous documents of the house of representatives for the first fty-first congress."

MONOGRAPH II.

le: Department of the interior | Monographs | of the |
s geological survey | Volume II | [Seal of the department
r] |
n | government printing office | 1882

: United States geological survey | J. W. Powell direc-
history | of the | Grand cañon district | with atlas | by
Dutton | captain of ordnance U. S. a. | [Survey design] |
n | government printing office | 1882

t of the publications of the survey, verso blank, 1 l.; general title lank; special title as above, verso blank; letter of transmittal to v, verso blank; preface, pp. vii–ix, verso blank; contents, including d atlas sheets, pp. xi–xiv; abstract of the monograph, pp. 1–8; text, , pp. 261–264. 4°. Plates I–XLII.

CONTENTS OF MONOGRAPH II.

Page.
nograph.. 1
l description of the topographic and geologic features of the Grand cañon dis-
.... 9
esozoic terraces upon the northern border of the district.................... 26
ription of the Vermilion cliffs and of the valley of the Virgen 51
eat denudation.. 61
roweap valley and the middle portion of the Grand cañon.................... 78
nkaret plateau.. 101
ney from Kanab across the desert to the Kaibab plateau and to the brink of
asm 122
enery of the Grand cañon in the Kaibab division viewed from point Sublime 140
phitheaters of the Kaibab division.................................. 157
ural geology and evolution of the Kaibab plateau.......................... 183
ria plateau and the Marble cañon platform.............................. 199
al history and evolution of the Grand cañon district...................... 206
cavation of the Grand cañon—corrasion and weathering...................... 230
cavation of the Grand cañon—origin of the details of its erosion............ 250

tlas sheets accompanies the text, as follows:

United States geological survey | J. W. Powell director |
company | the Tertiary history | of the | Grand cañon
ton | [Device: geologist's hammers crossed]

partment of the interior | United States geological sur-
owell director | Atlas | to accompany the monograph | on
history | of the | Grand cañon district | by | capt. Clar-
n U. S. a. | [Survey design] |
n 1882 | Julius Bien & co. lith. New York

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CONTENTS OF ATLAS TO MONOGRAPH II.

Sheet.

Title page and table of contents I
Sketch map showing the approximate distribution of the strata in the western part of the southern Plateau province II
Sketch map showing the approximate arrangement of the principal faults and displacements in the district of the High plateaus and in the Grand cañon district III
Panoramic view of the temples and towers of the Virgen IV
View of the Toroweap valley looking north from Vulcan's throne, and view of the Uinkaret plateau northwest from the same standpoint V
View looking eastward from Vulcan's throne, disclosing the inner gorge of the Grand cañon, the great esplanade, and the upper or outer walls on either hand VI
Map of the Uinkaret plateau .... VII, VIII
Panoramic views from the summit of mount Trumbull, on the Uinkaret plateau, looking eastward and southward, with distant glimpses of the Kanab division of the Grand cañon and some of its lateral gorges IX
Two views—one looking northward from the summit of mount Trumbull, the other looking north and northeast from the summit of mount Emma—exhibiting the basaltic cinder cones of the Uinkaret plateau X
Map of the southern portion of the Kaibab plateau, and of the Kaibab division of the Grand cañon, and of the lower portion of the Marble cañon .... XI, XII, XIII, XIV
The panorama from point Sublime in the Kaibab .... XV, XVI, XVII
The Transept. View of a lateral gorge opening into one of the branches of the Bright angel amphitheater in the Kaibab XVIII
View looking from the eastern brink of the Kaibab, and overlooking the Marble cañon platform XIX
Sheets from the general topographic and geologic atlas of the United States geological survey .... XX, XXI, XXII, XXIII

3,050 copies of both text and atlas published, being the 3,000 required by law and 50 extras ordered of the public printer by the author; bound in dark maroon cloth. Sold by the director of the U. S. geological survey at $10 for both parts.

Documentary edition as follows:

48th congress, | 2d session. | House of representatives. | Mis. doc. | no. 35. | Department of the interior | Monographs | of the | United States geological survey | Volume II | [Seal of the department of the interior] |
Washington | government printing office | 1885

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48th congress, | 2d session. | House of representatives. | Mis. doc. | no. 35. | Department of the interior | United States geological survey | J. W. Powell director | Atlas | to accompany the monograph | on the | | Tertiary history | of the | Grand cañon district | by | capt. Clarence E. Dutton U. S. a. | [Survey design]
[Washington: government printing office. 1885.]

The atlas of this edition is identical with that of the earlier edition except in binding and cover title. This atlas is not bound, but the sheets are laid loosely inside a heavy-paper cover, on the front of which the above half-title appears.

1,900 copies of text and atlas; published under a joint resolution approved March 2, 1885; about 800 of which were delivered unbound, as described; the remainder

sual, bound in sheep as vol. 11 of the "Miscellaneous documents of the
presentatives for the second session of the forty-eighth congress," the 23
s being folded quarto size and laid loosely inside half-sheep covers.

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tates geological survey | Volume III | [Seal of the department
erior] |
ngton | government printing office | 1882**

title: **United States geological survey | Clarence King direc-
logy | of the | Comstock lode and the Washoe district | with
George F. Becker | [Survey design] |
ngton | government printing office | 1882**

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e as above, verso blank; letter of transmittal, p. iii, verso blank; preface,
erso blank; contents, p. ix, verso blank; list of illustrations (in the text),
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o blank; text, pp. 1–404; note to chap. iii, pp. 405–408; index to mining
409–412; general index, pp. 413–422. 4°. Plates I–VII; figs. 1–33.
's name appears on the title-page of this monograph because it was pro-
work on it was begun under his directorship.

CONTENTS OF MONOGRAPH III.

Page.
asmittal III
.... V
.... IX
rations XI
sheets XIII
of results XV
The Comstock mines 1
Previous investigations of the Comstock lode 12
Lithology 32
Section 1. The rocks of the Washoe district 32
2. The decomposition of the rocks 72
3. Propylite 81
4. Detailed description of slides 91
Description of illustrations 145
Tables of analyses and assays 152
Structural results of faulting 156
The occurrence and succession of rocks 188
Chemistry 209
Heat phenomena of the lode 228
Section 1. General discussion 228
2. Thermal survey 244
The lode 266
On the thermal effect of the action of aqueous vapor on feldspathic rocks (kaolinization), by Carl Barus 290
On the electrical activity of ore bodies, by Carl Barus 309
Summary 368
ter III (on the determination of feldspars by Szabó's method) 405
mining claims 409
x 415

e of atlas sheets accompanies the text, as follows:

tle: **United States geological survey | Clarence King director |
accompany the | geology of the Comstock lode | and the |
district | Becker | [Geologist's hammers crossed]**

Title: Department of the interior | United States ge
vey | Clarence King director | Atlas | to accompany the
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by | George F. Becker | [Survey design] |
Washington | 1882 | Julius Bien & co. lith. New York

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CONTENTS OF ATLAS TO MONOGRAPH III.

Title
Contents
Map of the Washoe district, showing mining claims
Geological map of the Washoe district
Vertical cross-sections of the Comstock lode, through the Utah, Sierra nevada, Uni
& C. shafts
Vertical cross-sections of the Comstock lode, through the Sutro tunnel and the Forn
Vertical cross-sections of the Comstock lode, through the Combination, Yellow jacke
and Savage shafts
Horizontal cross-section of the Comstock lode on the Sutro tunnel level (1,900 feet).
Ditto. South end
Vertical longitudinal projection of the Comstock lode, showing the position of ore-bo
the Utah to the Potosi
Ditto. From the Bullion-Ward to the Baltimore consolidated
Ditto. From the Overman to the Silver hill
Comstock mine maps: no. 1, Utah, Sierra nevada
Ditto, no. 2. Sierra nevada, Union, Mexican
Ditto, no. 3. Ophir, California, Con. Virginia, Best & Belcher
Ditto, no. 4. Gould & Curry, Savage, Hale & Norcross, Chollar
Ditto, no. 5. Potosi, Bullion, Exchequer, Alpha, Imperial
Ditto, no. 6. Challenge, Confidence, Yellow jacket, Kentuck, Crown point, Belcher
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Ditto, no. 8. Lady Washington, Alta, Justice Woodville, Silver hill, Succor, Niaga
Ditto, no. 9. Knickerbocker, Baltimore consolidated

3,075 copies of both text and atlas published, the 3,000 required
extras ordered of the public printer by the author; bound in dark
Monograph III is sold by the director of the survey at cost price, $11
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47th congress, | 1st session. | House of representatives.
no. 52. | Department of the interior | Monographs | of t
States geological survey | Volume III | [Seal of the depar
interior]
Washington | government printing office | 1882

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remainder of volume as collated for the other edition. Atlas as follo

47th congress, | 1st session. | House of representatives.
no. 52. | Department of the interior | Monographs | of t
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iscellaneous documents of the house of representatives for the first session
ty-seventh congress."

MONOGRAPH IV.

l title: Department of the interior | Monographs | of the |
States geological survey | Volume IV | [Seal of the department
terior] |
ngton | government printing office | 1883

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Comstock | mining and miners | by Eliot Lord | [Survey de-

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ement of survey publications, pp. i-ii; general title as above, verso blank;
le as above, verso blank; letter of transmittal, p. vii, verso blank; preface,
contents (including list of plates), pp. xi-xiv; text, pp. 1-414; appendix
pp. 415-446; index, pp. 447-451. 4°. Plates I-III. (plate III being the
ate III of the atlas accompanying monograph III, by Becker).
g's name appears on the title-page of this monograph because it was pro-
work on it begun under his directorship.

CONTENTS OF MONOGRAPH IV.

Page.
The discovery of gold 1
The Gold cañon placer mining colony 15
The discovery of the Comstock lode 33
The mining camp 56
The foundation of a great mining town 77
The inevitable litigation 97
Constructive and disorganizing agencies 109
Interminable litigation 131
Industrial conflicts 181
The mining city 198
Six years of progress 216
The contests with water 230
A controlling combination 244
A hazardous task 263
A fortunate deliverance 278
The great bonanza 301
Feats of labor 322
The laborers of Washoe 355
Pains and perils of mining 389
A significant contrast 407
ables) 415

pies; bound in dark maroon cloth. Issued in the summer of 1884. Mono-
sold by the director of the survey at cost price, $1.50 a copy.
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ongress, | 1st session. | House of representatives. | Mis. doc. |
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eological survey | Volume IV | [Seal of the department of
ior] |
ngton | government printing office | 1883

ver with title as above; advertisement of the publications of the survey,
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for the first session of the forty-seventh congress."

MONOGRAPH V.

General title: Department of the interior | Monographs
United States geological survey | Volume v | [Seal of the
of the interior] |
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CONTENTS OF MONOGRAPH V.

Chapter I.—Introductory
  Literature
Chapter II.—Extent and general nature of the Keweenaw series
Chapter III.—Lithology of the Keweenaw series
  Section I.—Basic original rocks
  Section II.—Acid original rocks
  Section III.—Summary view of the original rocks of the Keweenaw series
  Section IV.—Detrital rocks
Chapter IV.—Structural features of the three classes of rocks of the Keweenaw serie
Chapter V.—General stratigraphy of the Keweenaw series
Chapter VI.—The Keweenawan rocks of the south shore of lake Superior
  Introductory
  Section I.—Keweenaw point
  Section II.—The region between Portage lake and the Ontonagon river
  Section III.—The south range
  Section IV.—The region between the Ontonagon river and Numakagon lake of
    including the Porcupine mountains
  Section V.—Northwestern Wisconsin and the adjoining part of Minnesota
Chapter VII.—The Keweenawan rocks of the north and east shores of lake Superior
  Introductory
  Section I.—The Minnesota coast
  Section II.—Isle Royale to Nipigon bay
  Section III.—Michipicoten island and the east coast of lake Superior
Chapter VIII.—Relations of the Keweenaw series to the associated formations
  Section I.—To the newer formations
  Section II.—To the older formations
Chapter IX.—Structure of the lake Superior basin
Chapter X.—The copper deposits
Notes

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nations being a repetition of those on pp. 129–140. 4°.

CONTENTS OF MONOGRAPH VI.

	Page.
smittal	v
geology of the Mesozoic areas	1
fossil flora	10
Description of the species	10
Fruits of cycads	85
Undetermined plants	90
General observations on the flora	92
older Mesozoic flora of North Carolina	97
General remarks and conclusions	121
of plates	129

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blank; index, pp. 195-200. 4°. Plates I-XVI; figs. 1-10.

CONTENTS OF MONOGRAPH VII.

Letter of transmittal
Contents
Illustrations
Preface
Brief outline of results
Chapter I.—General description of Eureka district
II.—Surface geology
III.—Structure of Prospect mountain
IV.—Structure of Ruby hill
V.—Ores of Prospect mountain and Ruby hill
VI.—The ore deposits
VII.—The source of the ore
VIII.—The manner of deposition of the ore
IX.—Water
X.—Do the Ruby hill deposits form a lode
XI.—Assaying
XII.—Prospecting
XIII.—Tribute system
XIV.—Timbering in the Eureka mines
XV.—Metallurgy
XVI.—Adams hill
XVII.—Future of Eureka district
XVIII.—Summary
Index

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ology | of | the Eureka district | by Charles Doolittle Wal-
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the author to Mr. Arnold Hague, geologist in charge, p. v., verso
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so blank; contents, p. xi, verso blank; illustrations, p. xiii, verso
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tter occupy but a page, precedes the plate and its recto is blank, but
ions require both sides of the leaf, the latter follows the plate. The
al in the general title of this monograph and the later ones differs
hat in the earlier ones.

CONTENTS OF MONOGRAPH VIII.

Page.
ttal to Mr. Arnold Hague, by the author V
ttal to the director, by Mr. Arnold Hague VII
.... IX
ts 1
nbrian 11
lenellus Howelli 32
er Silurian 65
onian 99
boniferous 212
species 268
in central Nevada 283

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253–264; index, pp. 265–269; plate explanations, pp. 270, 272, 274, a
page consecutively to and including 338, rectos blank, each explanati
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CONTENTS OF MONOGRAPH IX.

Letter of transmittal from Prof. George H. Cook........................
Sketch of the geology of the Cretaceous and Tertiary formations of New Jersey.......
Letter of transmittal from Prof. Robert P. Whitfield..........................
Preliminary remarks...
Brachiopoda...
Section I.—Brachiopoda of the marl beds...................................
Lamellibranchiata...
Section II.—Lamellibranchiata from the Raritan clays......................
III.—Lamellibranchiata from the lower marl beds...........................
IV.—Lamellibranchiata from the middle marl beds...........................
V.—Lamellibranchiata from the base of the upper marls.....................
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. 193-223, verso blank, and bibliography, pp. 225 237, verso blank;
3. 4°. Plates I-LVI; figs. 1-200. The plates are assembled after
f them (I, IX, XXVII, XLI, XLII, LV) are double, and one (LVI) is dis-
ted on cloth, it being about 23¼ by 16½ inches in size. Preceding
af bearing on verso the plate explanation and on recto the plate

CONTENTS OF MONOGRAPH X.

Page
.... v
.... vii
.... ix
.... xvii
.... 1
skull.. 11
lower jaw 35
teeth.. 41
brain.. 53
cervical vertebræ 69
dorso-lumbar vertebræ 79
fore limbs.. 87
fore limbs (continued) 101
ribs and sternum.. 129
pelvic arch and tail.. 135
hind limbs 139
hind limbs (continued) 145
rations of Dinoceras and Tinoceras.. 165
lusion.. 169
s.. 193
raphy 225
ipt.. 237

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northwestern Nevada | by | Israel Cook Russell | [Survey d
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CONTENTS OF MONOGRAPH XI.

Page.

ansmittal v
.... vii
monograph 1

-Introductory:

l of study 6
at basin 7
tions 15

-Genesis of lake Lahontan:

nation of lacustral basins 23
f the Lahontan basin 24
hical extent of lake Lahontan 28
hydrographic basin 28
lake basin 31
n of outlet 32

.—Physiography of the Lahontan basin:

.... 36
ns 38
.... 40
Humboldt 40
n river 41
Truckee 42
Carson 43
Walker 45
.... 47
nct springs 54
.... 55
ey lake, California 55
mid lake, Nevada 56
nemucca lake, Nevada 63
nboldt lake, Nevada 66
th Carson lake, Nevada 68
h Carson lake, Nevada 68
ker lake, Nevada 69
oe lake, Nevada and California 71
lakes, near Ragtown, Nevada 73
a-lakes and playas 81

—Physical history of lake Lahontan:

1. Shore phenomena in general 87
aces 88
cliffs 89
.... 90
ankments 93
as 96
pitulation 98
2. Shore phenomena of lake Lahontan 99
aces and sea-cliffs 100
and embankments 105
ankments at the west end of Humboldt lake 105
ankments on the southern border of the Carson desert 112
ankments at Buffalo springs, Nevada 115
as 123
3. Sediments of lake Lahontan 124
osures in the cañon of the Humboldt river 126
osures in the cañon of the Truckee river 131
osures in the cañon of the Carson river 137
osures in the cañon of the Walker river 138
eralized section of Lahontan sediments 143
eptional sedimentary deposits 146

Chapter IV.—Physical history of lake Lahontan—continued.
  Section 3. Sediments of lake Lahontan—continued.
      Pumiceous dust
      White marl
      Æolian sands
  Section 4. Ancient stream channels
  Section 5. Illustrations of geological structure
    Stratification and lamination
    Current bedding
    Contorted strata
    Arches of deposition
    Unconformity by erosion and deposition
    Jointing
    Faults
    Structure of terraces and embankments
    Conglomerates and breccias
    Oölitic sand
    Surface markings
    Color of lacustral sediments
  Résumé of physical history
Chapter V.—Chemical history of lake Lahontan.
  Section 1. General chemistry of natural waters
    River water
    Spring water
    Ocean water
    Waters of inland seas
    Succession of salts deposited on evaporation
    Deposition of calcium carbonate
  Section 2. Chemical deposits of lake Lahontan
    Calcareous tufa
      Lithoid tufa
      Thinolitic tufa
        Professor Dana's crystallographic study of thinolite
      Dendritic tufa
    Chemical composition of the tufa deposits
    Succession of tufa deposits
    Tufa deposits in the form of towers, domes, castles, crags, etc
    Conditions favoring the deposition of tufa
  Section 3. Desiccation products
    The freshening of lakes by desiccation
  Section 4. Efflorescences
    Buffalo springs salt works
    Eagle salt works
    Sand spring salt works
  Résumé of chemical history
Chapter VI.—Life history of lake Lahontan
  Summary
Chapter VII.—Résumé of history of lake Lahontan
Chapter VIII.—Quaternary climate
Chapter IX.—Geological age of lake Lahontan
Chapter X.—Post-Lahontan orographic movement
Index

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the volume of text), pp. xxv–xxvi; list of atlas sheets, pp. xxvii-xxviii;
results, p. xxix, verso blank; half-title to part I, p. 1, verso blank;
p. 3–313, verso blank; half-title of appendix A, p. 315, verso blank;
pendix A (repeated), pp. 317–318; text of appendix A, pp. 319–362;
rt II, p. 363, verso blank; contents of part II (repeated), p. 365; list
of part II (repeated), p. 366; text of part II, pp. 367–584; half-title
p. 585, verso blank; contents of appendix B (repeated), p. 587,
ext of appendix B, pp. 589–608; half-title of appendix C, p. 609,
contents of appendix C (repeated), pp. 611–612; text of appendix
verso blank; plates XXIII–XLV (which pertain to appendix C); list
l plates (also contained, in an abridged form, in the general list of
the beginning of the volume), pp. 749–750; index of letters used
-xlv), p. 751, verso blank; index (to the whole volume), pp. 753–770.
v; figs. 1–6.

me appears on the title-page of this monograph because it was proj-
on it was begun under his directorship.

CONTENTS OF MONOGRAPH XII.

Page.
al III
.... V
.... XIII
s XXV
.... XXVII
ults XXIX

PART I.

Geology.

CHAPTER I.

tion, discovery, and development 3
description 3
oach 6
e precious metals 7
f mines 10
ity 14
.... 15

CHAPTER II.

General geology of the Mosquito range
  Rocky mountains in Colorado
    Eastern uplift
    The parks
    Western uplift
    Mountain structure
  Mosquito range—Topography
    Geological history
    Mineral deposition
    Structural results of the dynamic movements
    Displacement—Volcanic rocks
    General erosion—Arkansas valley erosion
    Glacial erosion
    Stream erosion—Valleys

CHAPTER III.

Rock formations
  Sedimentary rocks
    Archean formations
      Granite
      Gneiss
      Amphibolite
      Relative age
    Paleozoic formations
      Cambrian
        Lower quartzite
      Silurian
        White limestone
        Parting quartzite
        Corresponding beds in Colorado range
      Carboniferous
        Blue or ore-bearing limestone
          Its composition
        Weber shales
        Weber grits
        Upper coal measures
    Mesozoic formations
    Quaternary formations
      Glacial or lake beds
      Recent or post-glacial
    Distribution of sedimentary formations
  Eruptive or igneous rocks
    Secondary eruptives
      Mount Zion porphyry—White porphyry
      Lincoln porphyry
      Gray porphyry
      Sacramento porphyry
      Pyritiferous porphyry
      Mosquito porphyry—Green porphyry—Silverheels porphyry
      Diorite
      Porphyrite
    Tertiary eruptives
      Rhyolite
      Trachyte—Andesite

CHAPTER IV.

Descriptive geology of the Mosquito range
  Introductory
    Surface features
    Glacial formations
    Post-glacial formations—Archean exposures
  Northeastern division
  Middle-eastern division

eology of the Mosquito range—continued. Page.
division 169
tern division 184

CHAPTER V.

eology of Leadville and vicinity 202
tructure 202
ion of porphyry bodies 206
of Mosquito fault 209
reen Mosquito and Ball mountain faults 215
reen Ball mountain and Weston faults 219
reen Weston and Mike faults 226
h of Breece fault 237
reen Mike and Iron-dome faults 244
reen Iron-dome and Carbonate faults 248
y horse syncline 253
l 255
mountain 257
t of Carbonate and Fryer hills 261
ion of transverse sections 263

CHAPTER VI.

geological phenomena 276
ary rocks 276
ean 276
zoic 277
ltic sediments 278
ntine 281
n of the serpentine 282
l features 284
and faults 284
of faults 387
ne-sided or S-shaped fold 290
rocks 292
..... 293
er of occurrence—Intrusive sheets 295
..... 296
ion of form to composition 297
nt of intrusive force 298
e of intrusive force 299
intrusive and not surface flows 300
nal structure 302
clastic and plagioclastic rocks 304
ibution of intrusive rocks in the Rocky mountains 305
ct metamorphism 307
bsorption of sedimentary rocks by eruptive masses 308

APPENDIX A, BY WHITMAN CROSS.

Petrography.

..... 319
n of classification in general 319
tion of Mosquito range eruptives 322
ves 323
rphyry 323
..... 333
te 334
ptives 345
..... 345
..... 353
..... 354
ctures observed—Individual rock types 355
lations of rock type—Rock constituents—Their decomposition 356
observations—Chemical composition 357
he Henry mountain rocks 359
dic rocks 359
ocks 361
..... 362

PART II.

Mining Industry.

CHAPTER I.

- Ore deposits
  - Classification of ore deposits in general
  - Leadville deposits
    - Manner of occurrence
    - Composition
    - Distribution
    - Secondary alteration—Mode of formation
    - Age of deposits—Origin of the metallic contents

CHAPTER II.

- Iron hill group of mines
  - Iron hill
    - General description
      - Geological structure
      - Later intrusive sheets
      - White porphyry
      - Blue limestone—Silurian—Cambrian—Iron fault
      - California fault
      - Dome fault—Emmet fault—Dome Hill
      - Ore deposits
    - Mine workings
  - North iron hill
    - General geological structure
      - Iron fault—Adelaide fault—Rock formations
      - Ore deposits
    - Mine workings

CHAPTER III.

- Carbonate hill group of mines
  - General structure
    - Rock formations
    - Carbonate fault
    - Pendery fault—Morning star fault—Ore deposits
    - Southwest slope of carbonate hill
  - Southern group of mines
  - Northern group of mines

CHAPTER IV.

- Fryer hill group of mines
  - General description
    - Rock formations
      - Gray porphyry
      - White porphyry
      - Weber quartzite—Blue limestone
      - Gangue—Ore deposits
      - Parting quartzite—White limestone—Lower quartzite
    - Explanation of Fryer hill map
  - Mine workings
  - Résumé

CHAPTER V.

- Other groups of mines
  - Mines and prospects in the Leadville region
  - Mines and prospects outside the Leadville district

CHAPTER VI.

- Genesis of Leadville deposits
  - Manner of occurrence—Why in blue limestone rather than in any other formati
  - Composition of ores
  - Composition of vein materials
  - Ores deposited as sulphides
  - More of formation
  - Origin or source of the metallic minerals

APPENDIX B, BY W. F. HILLEBRAND.

Chemistry.

Page.
and notes on methods employed 589
s 589
.... 596
materials 599

APPENDIX C, BY ANTONY GUYARD.

Metallurgy.

.... 613
ions of smelting 614
melting 636
operations 659
ng 692
sion 731
es 749
.... 753

tlas sheets accompanies the text, as follows.

t of the interior | United States geological survey | Clar-
lirector | Atlas | to accompany a monograph | on the |
mining industry | of | Leadville | Colorado | by | Samuel
mons | [Survey design] |
n | 1883 | Julius Bien & co. lith. New York

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CONTENTS OF ATLAS TO MONOGRAPH XII.

Sheets.
.... I
s II
.... III
.... IV
Topography V
Geology .... VI, VII
Geological sections .... VIII, IX, X
nity. Topography .... XI, XII
nity. Geology .... XIII, XIV
nity. Geological sections .... XV–XXII
and mine workings XXIII
cal sections .... XXIV, XXV
eology and mine workings XXVI
eological sections XXVII
eology and mine workings XXVII
eological sections .... XXIX, XXX
gy and mine workings XXXI
gical sections .... XXXII, XXXIII, XXXIV
Leadville map XXXV

f both text and atlas published — being the 3,000 required by the these monographs and 100 extras ordered by the author; the text is maroon cloth; the atlas sheets are laid loosely inside a paper cover. the 100 extras, the volume of text was issued in two separately rt I ending with p. 362, and part II commencing with p. 363 — pre- however, are the general and special titles, as in part I. The atlas h the atlas of the regular edition except the paper cover, which in not only in color but to such an extent in particularities of the title ad to the conclusion that the title was printed from still another plate.

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laneous documents of the house of representatives for the first session
ninth congress," the 35 atlas-sheets being folded quarto size and laid l
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ment of the interior] |
Washington | government printing office | 1888

Special title: United States geological survey | J. W.
rector | Geology | of the | quicksilver deposits | of the | Pac
with an atlas | by | George F. Becker | [Survey design] |
Washington | government printing office | 1888

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volume of text), p. ix, verso blank; list of atlas sheets, p. xi, verso bla
pp. xiii–xv, verso blank; brief outline of results, pp. xvii–xix, verso
pp. 1–475, verso blank; index, pp. 477–486. 4°. Plates I–VII; figs. 1–

CONTENTS OF MONOGRAPH XIII.

Letter of transmittal..
Preface..
Brief outline of results..
Chapter I. Statistics and history..
II. Notes on foreign occurrences of quicksilver..
III. The sedimentary rocks..
IV. The massive rocks..
V. Structural and historical geology of the quicksilver belt............
(Appendix to Chapter V, remarks on the genus *Aucella*, by Dr. C. A.
VI. Descriptive geology of the Clear lake region..
VII. Descriptive geology of Sulphur bank..
VIII. Descriptive geology of the Knoxville district..
IX. Descriptive geology of the New Idria district..
X. Descriptive geology of the New Almaden district..
XI. Descriptive geology of the Steamboat springs district..
XII. Descriptive geology of the Oathill, Great western, and Great eastern
XIII. Other deposits of the Pacific slope..
XIV. Discussion of the ore deposits..
XV. On the solution and percipitation of cinnabar and other ores..........
XVI. The origin of the ore..
XVII. Summary of results..
Index..

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nt of the interior | United States geological survey | J. W.
ctor | Atlas | to accompany a monograph | on the geology
cksilver deposits | of | the Pacific slope | by | George F.
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CONTENTS OF ATLAS TO MONOGRAPH XIII.	Sheet.
	I
	II
f the Clear lake district	III
f the Sulphur bank district	IV
f the Knoxville district ap of the region of Clear lake	V
f the New Idria district	VI
f the New Almaden district	VII
New Almaden shown beneath the topography	VIII
ngs of the New Almaden mine	IX
f the New Almaden mine on a broken line nearly north and south	X
uth sections of the New Almaden mine	XI
tions of the New Almaden mine	XII
of the New Almaden mine	XIII
the Steamboat springs district	XIV

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tor | Fossil fishes and fossil plants | of the | Triassic roc
Jersey and the Connecticut valley | by | John S. Newber
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tions of the Triassic rocks of New Jersey and the Connecticut valley
blank; text, pp. 3–15, verso blank; half-title, "Part II, fossil fishes
rocks of New Jersey and the Connecticut valley," p. 17, verso bl
19–76; half-title, "Part III, fossil plants of the Triassic rocks of New
Connecticut valley," p. 77, verso blank; text, pp. 79–95, verso bl
"Plates," verso blank, pp. [97–98]; "Plate I," verso explanation
[99]–100 (followed by plate I); "Plate II," verso explanation of same
(followed by plate II); etc. consecutively to "plate XXVI," verso e
same, pp. [149]–150 (followed by plate XXVI); index, pp. 151–15
I–XXVI.

CONTENTS OF MONOGRAPH XIV.

Letter of transmittal ....
Preface ....

PART I.

GEOLOGICAL RELATIONS OF THE TRIASSIC ROCKS OF NEW JERSEY AND THE CONNECTICU
Geological sketch ....
  Geological equivalents of our Triassic rocks ....

PART II.

FOSSIL FISHES OF THE TRIASSIC ROCKS OF NEW JERSEY AND THE CONNECTICUT VALLEY
Fossil fishes ....
  List of Triassic fishes ....
  Descriptions of genera and species ....
    Genus Ischypterus Egerton ....
      Ischypterus ovatus W. C. R. ....
        Marshii W. C. R ....
        Agassizii W. C. R ....
        micropterus, n. sp ....
        tenuiceps, Ag. sp ....
        fultus, Ag. sp ....
        robustus, n. sp ....
        elegans, n. sp ....
        alatus, n. sp ....
        modestus, n. sp ....
        lenticularis, n. sp ....
        lineatus, n. sp ....
        macropterus W. C. R ....
        Braunii, n. sp ....
        parvus W. C. R. (MS.) ....
        latus J. H. R ....
        minutus, n. sp ....
        gigas, n. sp ....

Page.

ontinued.

atopterus J. H. R. 50
pterus Redfieldi Egerton 53
    gracilis J. H. R 55
    minor, n. sp 57
    ornatus, n. sp 58
    anguilliformis W. C. R 59
    parvulus W. C. R 60
Dictyopyge Egerton 61
yopyge macrura Egerton 64
tycholepis, Ag 65
holepis Marshii Newb 66
centrophorus Traquair 67
ntrophorus Chicopensis, n. sp 69
iplurus Newb 70
urus longicaudatus Newb 74

PART III.

F THE TRIASSIC ROCKS OF NEW JERSEY AND THE CONNECTICUT VALLEY 77
ic flora 79
of genera and species 82
hycus triassicus, n. sp 82
Münsteriana Ung 84
um Rogersi Schimper 85
um Meriani(?) Brong 86
ura planicostata Rogers sp 87
yllum simile, n. sp 88
yllum brevifolium, n. sp 89
pis Münsteri Schimper 90
tes latior Saporta 90
tes brevifolius F. Br 91
ocarpus Chapini Newb., n. sp 92
s longifolius Emmons sp 92
simplex, n. sp 93
teris platyphylla Brong 94
(?) sp 94

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tes geological survey | Volume XV—text | [Seal of the de-
' the interior] |
ton | government printing office | 1889

Special title: United States geological survey | J. W.
rector | The Potomac | or | younger Mesozoic flora | by | W
ris Fontaine | [Survey design] |
Washington | government printing office | 1889

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tions of the survey, pp. i–iv; general title as above, verso blank; s
above, verso blank; contents, verso blank; illustrations, pp. vii–xii; l
mittal to the director, pp. xiii–xiv; text, pp. 1–348; half-title, "Table
tables, being lists of species and localities, pp. 350–372; index, pp. 373

CONTENTS OF MONOGRAPH XV.

Letter of transmittal
Introduction
Plant localities
Location and geology of the Potomac beds
  Location of the Potomac beds
  Geology of the Potomac beds
    Geological position and origin of the lower Potomac beds
Description of the species
  Cryptogams
      Equisetеæ
      Filices
  Phanerogams
    Gymnospermæ
      Zamieæ
      Coniferæ
      Gymnospermous fruits
    Undetermined plants
    Angiospermæ
General remarks and conclusions
  List of Potomac plants
Geological affinities of the Potomac plants
  Equiseta
  Ferns
  Cycads
  Conifers
  Angiosperms
Tables
Index

The plates are in a separate volume, as follows:

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tle: Department of the interior | Monographs | of the |
es geological survey | Volume XVI | [Seal of the depart-
nterior] |
on | government printing office | 1889

e: United States geological survey | J. W. Powell, direc-
eozoic fishes | of | North America | by | John Strong New-
vey design] |
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upper Silurian rocks" p. 17, verso blank: text, pp. 19-20; half-title,
of the Devonian age," p. 21, verso blank; text, pp. 23-74; half-title,
s of the Carboniferous system," p. 75, verso blank; text, pp. 77-228;
tes," verso blank, pp. [229-230]; "Plate I," verso explanation of
-232 (followed by plate I); "Plate II," verso explanation of same, pp.
wed by plate II); etc., consecutively to "Plate LIII," verso explanation
35]-336 (followed by plate LIII); index, pp. 337-340, 4°. Plates
.

CONTENTS OF MONOGRAPH XVI.

Page.
tal.. 11
.... 13
the upper Silurian rocks.. 17
f the Devonian age.. 21
Devonian fishes.. 25
l distribution of Devonian fishes.. 25
Fishes of the Corniferous limestone.. 26
eds of the Corniferous limestone.. 29
Fishes of the Hamilton group.. 57

Part III. Fishes of the Carboniferous system..
  Section A. Fishes of the Chemung group.......................................
  Section B. Fishes of the Catskill group.......................................
  Section C. Fishes of the Waverly group ....
  Section D. Fishes of the Cleveland shale......................................
    The structure and relations of Dinichthys ....
    The fins of Dinichthys...
    The eyes of Dinichthys ....
  Section E. Fishes of the Carboniferous limestone..............................
    Fishes of the lower Carboniferous rocks of New Brunswick...........
  Section F. Fishes of the Coal measures ....
    The structure and relations of Edestus......................................
Plates ....
Index...

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Special title: United States geological survey | J. W. tor | The flora | of the | Dakota group | a posthumous wo Lesquereux | Edited by F. H. Knowlton | [Survey design

Washington | government printing office | 1891

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CONTENTS OF MONOGRAPH XVII.

Page.
al 11
.... 13
.... 19
les 23
.... 23
.... 23
nycetes 23
.... 24
liaceæ 24
.... 26
rmæ 26
eæ 26
e 32
of uncertain relation 36
lones 37
eæ 37
eæ 37
.... 38
.... 39
.... 40
aceæ 41
aceæ 41
es 42
e 42
erræ 51
eæ 66
eæ 68
ceæ 72
æ 76
horeæ 87
æ 89
e 91
aceæ 108
chieæ 109
æ 109
æ 113
æ 114
.... 115
iaceæ 119
e 125
æ 127
e 136
lideæ 139
.... 142
osæ 145
iaceæ 154
e 156
eæ 158
aceæ 159
e 165
neæ 172
.... 176
.... 180
ceæ 182
rmaceæ 196
æ 198
aceæ 198
ies of uncertain relation 212
phyllum 212
s 213
obus 219
kiöldia 219
.... 220
tion 222
Dakota group flora 226

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sion of the fifty-second congress."

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ment of the interior] |
Washington | government printing office | 1892

Special title: United States geological survey | J. W. Po
rector | Gasteropoda and Cephalopoda | of the | Raritan cl
greensand marls | of | New Jersey | by | Robert Parr Whitfiel
vey design] |
Washington | government printing office | 1892

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of the survey, pp. i–v, verso blank; general title as above, verso blan
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of transmittal to the director by Geo. H. Cook, state geologist of New Jers
verso blank, letter of transmittal to Professor Cook by the author, p. 11, ve
preliminary remarks by the author, pp. 13–15, verso blank; half-title "Gast
p. 17, verso blank; text, pp. 19–239, verso blank; half-title "Cephalopod
verso blank; text, pp. 243–295, verso blank; half-title "Plates," verso
[297–298]; half-title "Plate I," verso explanation of same, pp. [299]-300
by plate I); half title "Plate II," verso explanation of same, pp. [301]-302
by plate II); etc. consecutively to half-title "Plate L," verso explanatio
pp. [397]-398 (followed by plate L); index, pp. 399–402. 4°. Plates I-
and 2.

CONTENTS OF MONOGRAPH XVIII.

Letter of transmittal from Prof. Geo. H. Cook..........
Letter of transmittal from Prof. R. P. Whitfield..........
Preliminary remarks..........
Gasteropoda..........
  Section I. Gasteropoda of the lower marl beds..........
  II. Gasteropoda of the middle marl bed..........
  III. Gasteropoda of the base of the upper marl bed..........
  IV. Gasteropoda of the Eocene marls..........
Cephalopoda..........
  Section V. Cephalopoda of the Cretaceous marls..........
  VI. Cephalopoda of the Eocene marls..........
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: Department of interior | Monographs | of the | United
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United States geological survey | J. W. Powell director
ee iron-bearing series | of | Michigan and Wisconsin |
uer Irving | and | Charles Richard Van Hise | [Survey

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rso blank; contents, pp. v–vii, verso blank; illustrations, pp. ix-
nsmittal by Van Hise, pp. xiii–xv, verso blank; outline of the mon-
xix, verso blank; introduction, pp. 1–4; text, pp. 5–474; half-title,
75; explanation of plate XIV, p. 476; followed by the plate; half-
' p. 477; explanation of plate XV, p. 478, followed by the plate; etc.
h half-titles on odd pages and explanations of plates on even pages
I," p. 521; explanation of plate XXXVII, p. 522, followed by the
523–534. 4°. Plates I–XXXVII; figs. 1–12.

CONTENTS OF MONOGRAPH XIX.

	Page.
ical explorations and literature	5
uthern complex	103
erty limestone	127
artz-slate member	143
on-bearing member	182
per slate member	296
uptives	346
stern area	360
l geology of the district	437

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At this writing monograph XIX is not yet out of press; the foregoi
therefore, which has been made up from final page proof, should be t
salis. The documentary edition has not, of course, been issued, bu
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MONOGRAPH XX.

General title: Department of the interior | Monograph
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Arnold Hague | [Survey design] |
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of the survey, pp. i–v, verso blank; general title as above, verso blan
as above, verso blank; contents, p. v, verso blank; illustrations, p. vi
p. viii; letter of transmittal, p. [ix], verso blank; preface, pp. xi–x
volume, pp. xv–xvii, verso blank; text, including appendixes A an
titles, pp. 1–394; explanation of plate III, pp. 395–396, followed by the
tion of plate, IV, p. 398, recto blank, followed by the plate; explanat
p. 400, recto blank, followed by the plate; explanation of plate V
blank, followed by the plate; explanation of plate VII, p. 404, recto
by the plate; explanation of plate VIII, p. 406, recto blank, followed
index, pp. 407–419. 4°. Plates I–VIII; figs. 1–9.

CONTENTS OF MONOGRAPH XX.

Outline of volume ....
Chapter I.—General description..
Chapter II.—Geological sketch of the Eureka district.............................
Chapter III.—Cambrian and Silurian rocks ....
Chapter IV.—Devonian and Carboniferous rocks ....
Chapter V.—Descriptive geology..
Chapter VI.—General discussion of the Paleozoic rocks ....
Chapter VII.—Pre-Tertiary igneous rocks ....
Chapter VIII.—Tertiary and post-Tertiary volcanic rocks ....
Chapter IX.—Ore deposits ....
Appendix A.—Systematic lists of fossils of each geologic horizon. By C. D. Walco
Appendix B.—Microscopical petrography of the eruptive rocks. By J. P. Iddings.

Accompanied by an atlas, as follows:

Department of the interior | United States geological s
ence King, director | Atlas | to accompany the monogra
geology | of the | Eureka district | Nevada | by | Arnold H
vey design] |
Washington | 1883 [*sic*] | Julius Bien & co. lith. New Y

13 sheets, folio (first four single, last nine double), laid loosely in
paper cover bearing title as given above.

The title of this atlas bears Mr. King's name because the mono
jected and work on it begun under his directorship, and it bears th
cause it was engraved at that time, although the atlas was not issued
was ready, in 1892.

CONTENTS OF ATLAS TO MONOGRAPH XX.

	Sheet
cover)	I
sheets and legend	II
cal and index map of the Eureka district	III
nap of the Eureka district	IV
nap of the northwest sheet	V
nap of the northeast sheet	VI
nap of the northwest-central sheet	VII
nap of the northeast-central sheet	VIII
nap of the southwest-central sheet	IX
nap of the southeast-central sheet	X
nap of the southwest sheet	XI
nap of the southeast sheet	XII
ross-sections	XIII

pies of both text and atlas published, the number required by law; text
dark maroon cloth; atlas sheets in paper cover. Monograph XX is sold by
or of the survey at $5.25 for both parts, the cost of their publication.
ntary edition as follows:

ngress, | 1st session. | House of representatives. | Mis. doc. |
| Department of the interior | Monographs | of the | United
eological survey | Volume XX | [Survey design] |
ington | government printing office | 1892

r; general title as above, verso blank; sample library catalogue slips,
ık, 1 l.; advertisement of the publications of the survey, pp. i-v, verso
en follow special title, contents, and remainder of volume as collated for
edition.

s furnished with this edition is identical in title and contents with that
ying the other edition, the distinguishing mark being that in this edition
cover bears in its upper right corner a pasted slip on which is printed:
gress, 1st session. | House of representatives. | Mis. doc. no. 343.

pies, the "usual number" edition, published under authority of a joint
approved July 7, 1882. Of these, a portion (about 600) were issued un-
described; the remainder were printed later and bound in sheep as
the "Miscellaneous documents of the house of representatives for the first
the fifty-second congress."

BULLETINS.

BULLETIN 1.

Department of the interior | Bulletin | of the | United
gical survey | no. 1 | On hypersthene-andesite and on tri-
e in augitic | rocks, by Whitman Cross; with a geological
ffalo peaks, Colorado, by S. F. Emmons, geologist- | in-
ky mountain division |
| government printing office | 1883

: Department of the interior | Bulletin | of the | United
gical survey | no. 1 | [Seal of the department of the in-

| government printing office | 1883

United States geological survey | J. W. Powell direc-
ersthene-andesite | and on | triclinic pyroxene in augitic
hitman Cross | with a | geological sketch of Buffalo peaks
| S. F. Emmons | geologist in charge of Rocky mountain
vey design] |
| government printing office | 1883

aring title as above; advertisement of the publications of the survey,
title as above, verso blank; special title as above, verso blank; letter
Mr. Emmons to the director, p. "7–8," verso blank; contents and
'9–10," verso blank; "Errors in bulletin 1, United States geological
ank, 1 l.; introductory sketch by Emmons, pp. 11–17, verso blank;
. 19–38; index, pp. 39–42; "notice" (as to numbering and binding)
k cover; 8°. Plates I and II. A second (volume) pagination, in
arried through the text at the foot of the pages. In this (the first)
niform with the regular pagination; and it is explained by the
from the advertisement:

> will each contain but one paper, and be complete in itself. They
> numbered in a continuous series, and will in time be united into
> nient size. To facilitate this each Bulletin will have two pagin-
> r to itself at the top, and at the bottom, one which belongs to it in

CONTENTS OF BULLETIN 1.

Page.
.... 7
cal sketch of Buffalo peaks, by S. F. Emmons 11
site and on triclinic pyroxene in augitic rocks, by Whitman Cross 19
hene-andesite from Buffalo peaks, Colorado 19
ck 19
oxene in other rocks 23
ition of the rock 25
lysis of hypersthene 26

Chapter II.—Rhombic pyroxene in other andesites ....
  Previous observations of rhombic pyroxene in augite-andesites ....
    Rhombic pyroxene in diabasic rocks ....
    Rhombic pyroxene in hornblende-andesite ....
  Classification of andesitic rocks ....
  Results ....

3,200 copies published—3,000 required by the law relating to these 200 extras ordered by the authors. The selling price of this bulletin

Documentary edition of bulletin 1 as follows:

47th congress, | 2d session. | House of representatives.
no. 16. | Department of the interior | Bulletin | of the | Uni
geological survey | no. 1 | On hypersthene-andesite and
pyroxene in augitic | rocks, by Whitman Cross; with
sketch of | Buffalo peaks, Colorado, by S. F. Emmons, ge
charge of Rocky mountain division |
Washington | government printing office | 1883

Outside title as above, on white paper; advertisement, general titl and remainder of collation as in the other edition.

1,900 copies, the "usual number" edition; published by authority lution approved July 7, 1882. Of these, about 800 were delivered u scribed above; the remainder were printed later and bound in sheep 1 of the "Miscellaneous documents of the house of representatives session of the forty-seventh congress."

This bulletin appears again in the documentary edition of vol. I, which will be found *infra* between the descriptions of bulletins 6 and

BULLETIN 2.

Cover title: Department of the interior | Bulletin | of
States | geological survey | no. 2 | Gold and silver conve
giving the coining values | of troy ounces of fine metal, and
of | fine metal represented by given sums | of United State
Washington | government printing office | 1883

General title: Department of the interior | Bulletin | of
States | geological survey | no. 2 | [Seal of the departme
terior] |
Washington | government printing office | 1883

Special title: United States geological survey | J.
director | Gold and silver | conversion tables | giving
values of troy ounces of fine metal, and the | weights o
represented by given | sums of United States money | com
Albert Williams, jr., | chief of division of mining statisti
nology | [Survey design] |
Washington | government printing office | 1883

Paper cover bearing title as above; advertisement of the public survey, 1 unpaged leaf; general title as above, verso blank; special verso blank; the tables, pp. 5-8 (47-50 of the volume); notice as to n binding, outside of back cover. 8°.

3,000 copies published, being the number required by the law re bulletins. The selling price of this bulletin is 5 cents.

locumentary edition of this bulletin and subsequent ones separately.
s appear separately in documentary form, but thereafter, seeing that
ns would appear within a year and that they were prepared for com-
volumes, it was concluded to issue a documentary edition of the vol-
f one of each brochure. For description of the documentary edition
ra between descriptions of bulletins 6 and 7.

BULLETIN 3.

: Department of the interior | Bulletin | of the | United
logical survey | no. 3 | On the fossil faunas of the upper
long the | meridian of 76° 30′ from Tompkins county N.
ford county Pa. |
on | government printing office | 1884

tle: Department of the interior | Bulletin | of the | United
logical survey | no. 3 | [Seal of the department of the

on | government printing office | 1884

le: United States geological survey | J. W. Powell direc-
e fossil faunas | of the | upper Devonian | along the meri-
30′ from Tompkins county, N. Y., | to Bradford county,
enry S. Williams | [Survey design] |
on | government printing office | 1884

bearing title as above; advertisement of the publications of the sur-
l leaf; general title as above, verso blank; special title as above,
ext, pp. [5]-31 (55-81 of the volume) verso blank; index, pp. 33-36;
mbering and binding, outside of back cover. 8°.
published, being the number required by the law relating to these
e price of this bulletin is 5 cents.

BULLETIN 4.

: Department of the interior | Bulletin | of the | United
ogical survey | no. 4 | On Mesozoic fossils |
on | government printing office | 1884

le: Department of the interior | Bulletin | of the | United
ogical survey | no [*sic*] 4. | [Seal of the department of the

on | government printing office | 1884

le: United States geological survey | J. W. Powell direc-
esozoic fossils | by | Charles A. White, m. d. | [Survey de-

on | government printing office | 1884

bearing title as above; advertisement of the publications of the sur-
l leaf; general title as above, verso blank; special title as above, verso
s and illustrations, verso blank, 1 leaf; text, pp. [5]-17 (93-105 of the
blank; index, p. [19]; explanation of plate I, p. 20 (followed by the
ation of plate II, p. 22, recto blank (followed by the plate); etc. even
ectos blank, each followed by a plate; notice as to numbering and
le of back cover. 8°. Plates I-IX.

CONTENTS OF BULLETIN 4.

Description of certain aberrant forms of the Chamidæ from the Cretaceous rocks of
On a small collection of Mesozoic fossils obtained in Alaska by Mr. W. H. Dall.
States Coast Survey..
On the Nautiloid, genus Enclimatoceras Hyatt, and a description of the type specie

3,000 copies published, being the number required by the law rel
bulletins. Price, 5 cents.

BULLETIN 5.

Cover title: Department of the interior | Bulletin | of
States | geological survey | no. 5 | A dictionary of altit
United States |
Washington | government printing office | 1884

General title: Department of the interior | Bulletin | of
States | geological survey | no. 5 | [Seal of the departn
interior] |
Washington | government printing office | 1884

Special title: United States geological survey | J. W. Pow
A | dictionary of altitudes | in | the United States | co
Henry Gannett | chief geographer | [Survey design] |
Washington | government printing office | 1884

Paper cover bearing title as above; advertisement of the publicati
vey, 1 unpaged leaf; general title as above, verso blank; special title
blank; letter of transmittal, verso blank, 1 leaf; contents, pp. [7]-8
authorities, pp. [9]-16; abbreviations of names of railroads given as
[17]-24; the dictionary of altitudes, pp. [25]-325 (149-449 of the volu
to numbering and binding, outside of back cover 8°.

Arranged alphabetically by states, and within each state by railro

3,500 copies—the 3,000 required by the law relating to these bul
additional ordered by the department. Price, 20 cents. See bulletin

BULLETIN 6.

Cover title: Department of the interior | Bulletin | of
States | geological survey | no. 6 | Elevations in the
Canada |
Washington | government printing office | 1884

General title: Department of the interior | Bulletin | of
States | geological survey | no. 6 | [Seal of the departme
terior] |
Washington | government printing office | 1884

Special title: United States geological survey | J. W
rector | Elevations | in the | dominion of Canada | by | J.
[Survey design] |
Washington | government printing office | 1884

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vey, 1 unpaged leaf; general title as above, verso blank; special
verso blank; letter of transmittal, verso blank, 1 leaf; preface, verso
table of contents, verso blank, 1 leaf; the tables of elevations, pp. [

lume), verso blank; title for vol. I (see below), verso blank; contents for iii, verso blank; illustrations for vol. I, p. v, verso blank; notice as to g and binding, outside of back cover. 8°.

CONTENTS OF BULLETIN 6.

	Page.
ransmittal	5
	7
	11
western railway	11
gton, Grey and Bruce railway	15
d railway	17
on and northwestern railway	17
rn railway	18
o, Grey and Bruce railway	20
valley railway	21
southern railway	22
trunk railway	23
o and Nipissing railway	29
d railway	29
and Quebec railway	31
awrence and Ottawa railway	32
awrence river	33
river and Rideau navigation co	33
Montreal, Ottawa and occidental railway	33
list of elevations in Canada, abstracted from the foregoing profiles	35

pies, the number required by the law relating to these bulletins. Price, 5

ns 1-6 form vol. I, as follows:

rtment of the interior | Bulletins | of the | United States | al survey | Vol. I | [Seal of the department of the interior] | ington | government printing office | 1884

above, verso blank; contents of the volume, p. iii, verso blank; illustra- he volume, p. v, verso blank; the six bulletins, pp. 1-493. 8°. 11 plates. entary edition of vol. I, as follows:

congress, | 1st session. | House of representatives. | Mis. doc. 1. | Department of the interior | Bulletins | of the | United geological survey | Vol. I | ington | government printing office | 1884

above on white paper; then follow title, contents, illustrations, and re- of volume as in the other edition.

opies published, the "usual number" edition. A portion of the edition 0) were delivered unbound, as described above; the remainder were printed bound in sheep, in which form they constitute the greater part of vol. 36 iscellaneous documents of the house of representatives for the first session rty-eighth congress."

BULLETIN 7.

title: Department of the interior | Bulletin | of the | United geological survey | no. 7 | A catalogue of geological maps to | North and South America | ington | government printing office | 1884

al title: Department of the interior | Bulletin | of the | United geological survey | no. 7 | [Seal of the department of the] | ington | government printing office | 1884

Special title: United States geological survey | J. W. Powe
| Mapoteca geologica americana | A catalogue | of | geologic
of | America (North and South) | 1752–1881 | in geographic
nologic order | by | Jules Marcou and John Belknap Marcou
design] |
Washington | government printing office | 1884

Paper cover bearing title as above; advertisement of the publications
vey, 1 unpaged leaf; general title as above, verso blank; special titl
verso blank; contents, p. v, verso blank; contractions used in reference
introduction (signed Jules Marcou, Cambridge, Mass., September, 188
verso blank; the catalogue, pp. 19–171, a supplement beginning on p. 1
authors and places, pp. 173–184; notice as to numbering and binding, out
cover. 8°. A volume pagination, in parentheses, appears at the foot o
The catalogue is arranged geographically, from Arctic America to Tierr
and chronologically under each division.

3,000 copies published, being the number required by the law relati
bulletins. Price 10 cents.

BULLETIN 8.

Cover title: Department of the interior | Bulletin | of th
States | geological survey | no. 8 | On secondary enlargemen
eral fragments | in certain rocks. |
Washington | government printing office | 1884

General title: Department of the interior | Bulletin | of th
States | geological survey | no. 8 | [Seal of the department
terior] |
Washington | government printing office | 1884

Special title: United States geological survey | J. W. Powe
| On | secondary enlargements | of | mineral fragments | i
rocks | by | R. D. Irving and C. R. Van Hise | [Survey desig
Washington | government printing office | 1884

Paper cover bearing title as above; advertisement of the publications
vey, 1 unpaged leaf; general title as above, verso blank; special titl
verso blank; letter of transmittal by Irving to the director, p. 5, verso
tents, p. 7, verso blank; illustrations, pp. 9–10; text, pp. 11–52 (195–236
ume); index, pp. 53–56; notice as to numbering and binding, outside of
8°. Plates I–VI; figs. 1–4.

CONTENTS OF BULLETIN 8.

Letter of transmittal..
Contents...
List of illustrations...
Part I.—Enlargements of quartz fragments and genesis of quartzites, by R. D. Irvi
R. Van Hise...
General considerations...
List of localities of rocks examined, with brief descriptive notes................
For Huronian rocks..
In the typical Huronian of lake Huron..
In the iron-bearing series of Marquette, Mich...................................
In the iron-bearing series of the Penokee region of Wisconsin ....
In the slates of the saint Louis river, Minnesota................................
In the quartzite formation of the Baraboo region of Wisconsin ....

nlargements of quartz fragments and genesis of quartzites—continued. Page.
In the quartzite formation of southern Minnesota 34
In the Animikie series of northern Minnesota and the Thunder bay region of lake Superior 35
In the folded schists of the national boundary line north of lake Superior 37
r Keweenawan sandstones 38
r Cambrian rocks 39
In the Grand cañon group of the Colorado river 39
In the Potsdam-sandstone of the Mississippi valley 39
In the Eastern sandstone of lake Superior 40
In the Western sandstone of lake Superior 41
r Silurian rocks 41
In the saint Peter's sandstone of Wisconsin 41
In the Eureka quartzite of Nevada 42
r Devonian rocks 42
r Carboniferous rocks 43
r Triassic rocks 43
r Cretaceous rocks 43
Enlargements of feldspar fragments in certain Keweenawan sandstones, by C. R. Van 44
Summary of general conclusions, by R. D. Irving 48

opies published, the number required by the law relating to these bulletins.
cents.

BULLETIN 9.

title: Department of the interior | Bulletin | of the | United
geological survey | no. 9 | A report of work done in the Wash-
oratory | during the fiscal year 1883–'84 |
hington | government printing office | 1884

al title: Department of the interior | Bulletin | of the | United
geological survey | no. 9 | [Seal of the department of the in-
|
hington | government printing office | 1884

al title: United States geological survey | J. W. Powell director
port of work done | in the | Washington laboratory | during
scal year 1883–'84 | F. W. Clark chief chemist | T. M. Chatard
t chemist | [Survey design] |
hington | government printing office | 1884

cover bearing title as above; advertisement of the publications of the sur-
paged leaf; general title as above, verso blank; special title as above, verso
contents, p. 5, verso blank; introductory, by Clarke, p. 7, verso blank;
9–37 (249–277 of the volume), verso blank; index, pp. 39–40; notice as to
ng and binding, outside of back cover. 8°.

CONTENTS OF BULLETIN 9.

Page.
ry 7
ock, and ore analyses 9
te, from Montgomery county, Maryland 9
nd pectolite, from Alaska 9
rite, from Shasta county, California 10
te, from Topsham, Maine 10
from Greene county, Tennessee 11
rite, from Stoneham, Maine 11
rite 11
te, from Norway, Maine 12

Mineral, rock, and ore analysis—continued.
  Halloysite, from California
  Prochlorite
  Alum rock, from Grant county, New Mexico
  Scoriaceous Obsidian, from Mono valley, California
  Powder, from Truckee river, Nevada
  Marl, from Pyramid lake, Nevada
  Clays, from Mill City, Nevada
  Basalt, from mount Thielson, Oregon
  Basalt, from Pit river, California
  Dacites, from Lassen's peak, California
  Limestones, from Moundsville, West Virginia
  Magnetite, from near Bozeman, Montana
  Limonite, from Canaan mountain, West Virginia
  Coal, from Cranston, Rhode Island
Water analyses
  Pyramid lake, Nevada
  Winnemucca lake, Nevada
  Walker lake, Nevada
  Walker river
  Humboldt river, Nevada
  Hot spring, foot of Granite mountain, Nevada
  Hot spring, Hot spring station, Nevada
  Larger Soda lake, Ragtown, Nevada
  Mono lake, California
  Spring on Tufa crag in Mono lake, California
  Warm spring, Mono basin, California
  Boiling spring, Honey lake valley, California
  Lake Tahoe, California
  Abert lake, Oregon
  Utah lake, Utah
  City creek, Utah
  Bear river, Utah
  Utah hot springs
  Livingston warm springs, Montana
  Warm springs, Emigrant gulch, Montana
  Helena hot springs, Montana
  Mill creek cold springs, Montana
  Virginia hot springs, Bath county, Virginia
The estimation of alkalies in silicates, by T. M. Chatard

3,150 copies published—3,000 required by the law relating to these
150 extras ordered by the author. Price, 5 cents.

BULLETIN 10.

Cover title: Department of the interior | Bulletin | of
States | geological survey | no. 10 | On the Cambrian fau
America |
Washington | government printing office | 1884

General title: Department of the interior | Bulletin | of
States | geological survey | no. 10 | [Seal of the departme
terior] |
Washington | government printing office | 1884

Special title: United States geological survey | J. W.
tor | On | the Cambrian faunas | of | North America |
studies | by | Charles Doolittle Walcott | [Survey design]
Washington | government printing office | 1884

Paper cover bearing title as above; advertisement of the publicati
vey, 1 unpaged leaf; general title as above, verso blank; special

; letter of transmittal, p. 5, verso blank; contents and illustrations, p.
k; text, pp. 9–51 (289–331 of the volume), verso blank; index, pp. 53–55;
of plate I, p. 56 (plate I facing); explanations of the remaining plates,
2, 64, 66, 68, 70, 72, and 74 (rectos blank, plates facing explanations);
numbering and binding, outside of back cover. 8°. Plates I–X (IX being

CONTENTS OF BULLETIN 10.

Page.
mittal 5
auna of the saint John formation, contained in the Hartt collection 9
Braintree argillites 43
s and species of Phyllopoda from the middle Cambrian 50

s published—3,000 required by the law relating to these bulletins,
as ordered by the author. Price, 5 cents.

BULLETIN 11.

itle: Department of the interior | Bulletin | of the | United
eological survey | no. 11 | On the Quaternary and recent Mol-
e | Great basin, with descriptions of new forms |
gton | government printing office | 1884

title: Department of the interior | Bulletin | of the | United
eological survey | no. 11 | [Seal of the department of the in-

gton | government printing office | 1884

itle: United States geological survey | J. W. Powell direc-
e | Quaternary and recent Mollusca of the | Great basin |
iptions of new forms | by | R. Ellsworth Call | Introduced by
of the Quaternary lakes of the Great basin | by | G. K. Gil-
rvey design] |
gton | government printing office | 1884

er bearing title as above; advertisement of the publications of the sur-
ged leaf; general title as above, verso blank; special title as above,
; contents, p. 5, verso blank; illustrations, p. 7, verso blank; introduc-
by Gilbert, pp. 9–12; text by Call, pp. 13–49 (367–403 of the volume),
; index, pp. 51–56; plate explanations, pp. 58, 60, 62, 64, and 66 (rectos
s facing the explanations); notice as to numbering and binding, outside of
8°. Plates I–VI.

CONTENTS OF BULLETIN 11.

Page.
ketch of the Quaternary lakes of the Great basin, by G. K. Gilbert 9
nary and recent Mollusca of the Great basin, with descriptions of new forms, by
Call 13
alogue of the recent and Quaternary shells of the Great basin 13
on 13
.... 14
librauchiata 14
opoda 16
oda 23
nd environment 26
c and chronologic distribution 26
tion *versus* salinity 30
tion *versus* temperature 38
ric distribution 41
s 43

Page.
Descriptions of new forms 44
  Valvatidæ 44
    Valvata sincera var. *utahensis* 44
  Rissoidæ 45
    Amnicola dalli 45
  Limnæidæ 47
    Radix ampla var. *utahensis* 47
    Limnophysa bonnevillensis 49

3,200 copies published—3,000 required by the law relating to these bulletins, and 200 extras ordered by the author. Price, 5 cents.

BULLETIN 12.

Cover title: Department of the interior | Bulletin | of the | United States | geological survey | no. 12 | A crystallographic study of the thinolite of lake Lahontan. |
Washington | government printing office | 1884

General title: Department of the interior | Bulletin | of the | United States | geological survey | no. 12 | [Seal of the department of the interior] |
Washington | government printing office | 1884

Special title: United States geological survey | J. W. Powell director | A | crystallographic study | of the | thinolite of lake Lahontan | by | Edward S. Dana | [Survey design] |
Washington | government printing office | 1884

Paper cover bearing title as above; advertisement of the publications of the survey, 1 unpaged leaf; general title as above, verso blank; special title as above, verso blank; letter of transmittal by G. K. Gilbert, geologist in charge of the division, to the director, p. 5, verso blank; contents and illustrations, p. 7, verso blank; text, pp. 9–28 (429–448 of the volume); index, p. "29–30," verso blank; explanations of plates, pp. 32 and 34 (rectos blank, plates facing the explanations); notice as to numbering and binding, outside of back cover. 8°. Plates I–III; fig. 1.

CONTENTS OF BULLETIN 12.

Page.
Letter of transmittal 5
Introductory statement 9
  Varieties of tufa 10
  Succession of tufa deposits 11
Crystallographic study 14
  General aspect of the thinolite 15
  Thinolite from Pyramid lake 15
  Examination of sections of crystals 17
  Thinolite from Mono lake 19
  Thinolite from Walker lake and from Black rock and Smoke creek deserts 20
Original crystalline form of the thinolite 20
Chemical nature of the original mineral 22
Relation of the thinolite to the so-called Gaylussite pseudomorphs of Sangerhausen and other localities 25

3,100 copies published—3,000 required by the law relating to these bulletins, and 100 extras ordered by the author. Price, 5 cents.

BULLETIN 13.

Cover title: Department of the interior | Bulletin | of the | United States | geological survey | no. 13 | Boundaries of the United States

veral | states and territories, with a historical | sketch of
changes |
| government printing office | 1885
: Department of the interior | Bulletin | of the | United
gical survey | no. 13 | [Seal of the department of the in-

| government printing office | 1885
: United States geological survey | J. W. Powell direc-
ies | of | the United States | and of the | several states and
ith a | historical sketch of the territorial changes | by |
tt | chief geographer | [Survey design] |
| government printing office | 1885

earing title as above; advertisement of the publications of the sur-
eaf; general title as above, verso blank; special title as above, verso
transmittal, p. 5, verso blank; contents, pp. 7–8; text, pp. 9–129
volume), verso blank; index, pp. 131–135; notice as to numbering
side of back cover. 8°.

CONTENTS OF BULLETIN 13.

Page.
nited States and additions to its territory........................ 9
he United States.. 9
territory of the United States.................................... 19
rchase.. 19
.... 21
.... 21
an cession... 22
rchase.. 22
.... 23
nd an outline of the history of the changes made therein 24
states... 24
vest of the river Ohio.. 27
of the river Ohio.. 29
ne territory acquired from Mexico 30
ne states and territories (in usual geographical order, from Maine to Cali-
.... 32

blished, the number required by the law relating to these bulletins.

BULLETIN 14.

Department of the interior | Bulletin | of the | United
gical survey | no. 14 | On the physical characteristics of
rets | more particularly on the galvanic thermo-electric |
properties of wrought iron steel | and cast iron in dif-
of hardness | together with a physical diagram for | the
of iron-carburets |
| government printing office | 1885
: Department of the interior | Bulletin | of the | United
gical survey | no. 14 | [Seal of the department of the in-

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rector | The | electrical and magnetic properties | of the | iron-carburets | by | Carl Barus and Vincent Strouhal | [Survey design] | Washington | government printing office | 1885

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CONTENTS OF BULLETIN 14.

Page.

Introduction 13

The relation between electrical conductivity and temperature in case of steel in different states of hardness, of wrought iron, and of cast iron 15

- Steel 15
- Wrought iron 20
- Cast iron 22
- Deductions 24
- Addendum: Statement of a resistance method for the measurement of heat conductivity 25

The conditions which in the case of steel essentially determine the efficacy of the operation of tempering; the measurement of the state of hardness of steel 28

- Introductory remarks 28
- Apparatus for imparting glass-hardness to steel 29
- Measurement of thermo-electric power 31
- Measurement of electrical conductivity 36
- The operation of sudden cooling. Glass-hardness 38
- Behavior of hard steel rods annealed in hot oil baths 40
- On the bearing of the time of exposure on the efficacy of annealing 43
- Behavior of hard steel annealed in vapor of boiling methyl alcohol (66°) 47
- Behavior of hard steel annealed in steam (100°) 49
- Behavior of hard steel annealed in vapor of boiling aniline (185°) 51
- Behavior of hard steel annealed in molten lead (330°) 53
- General discussion of the results of this annealing 54
- The effect of higher and of lower temperatures on the temper of steel originally annealed at a given intermediate temperature 57
- Behavior of soft steel rods 60
- The relation existing between the thermo-electric power and the specific resistance of steel 62
- Sources of error 68
- Concluding remarks 70
- Addendum: On a simple method for the galvanic calibration of a wire 73

The nature of the phenomenon of temper, as observed in steel, discussed from an electrical standpoint, particularly in reference to the analogous behavior of malleable cast iron and of alloys of silver 76

- Introduction 76
- Experiments with alloys 80
- The general phenomenon of temper regarded from the chemical and from the mechanical standpoint 88
- The phenomenon of glass-hardness discussed from the chemical and from the mechanical standpoint 98
- Experiments with malleable cast iron 100

The thermo-electric effect of magnetization 104

The influence of hardness on the maximum of magnetization which thin cylindrical steel rods of different dimensions permanently retain 111

- Plan and purpose of the present experiments 111
- The material used 115
- Method of magnetization 118
- Measurement of magnetic moment 120
- Determination of the degree of hardness 121
- Method of annealing 123
- Magnetic results for rods of large dimension-ratio 125
- Results with rods of smaller dimensional ratio 128

e of hardness on the maximum of magnetization, etc.—continued. Page.
ou 136
on 148
m: Density-effect of incipient annealing of hard steel 149
ng of steel considered in its bearing on the power of magnetic retention, and on the
of magnetic stability of this material 151
tion 151
eness as regards variation of temperature 152
c retentiveness as regards the effects of percussion, etc 166
m: Results of H. Wild, of St. Petersburg, with magnets tempered and magnetized
method proposed in this chapter 171
efinition of steel based on the electrical behavior of iron with gradually increasing
carburation 173
tion 173
t iron 176
.... 177
n 178
on 184
cial or impure iron-carburets 188
neralization 190
ry of the principal data 194
On the relation between the thermo-electric properties, the specific resistance, and
es of steel (1879) 203
tory remarks 203
us for hardening thin steel wire 204
of measuring the hardness of steel electrically 205
ation of thermo-electric hardness. Apparatus 208
ation of specific resistance 210
ental results 211
s and thermo-electric properties of steel: deductions and supplementary experi-
.... 217
s and specific resistance of steel: deductions 223
on the above considered as auxiliary to the determination of the relation between
es and magnetic moment 225

ies published—the 3,000 required by the law relating to these bulletins,
tras ordered by the author. The latter have a leaf of dedication. Price,
See bulletins 27 and 35.

s 7–14 form vol. II, as follows:

ment of the interior | Bulletins | of the | United States | geo-
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above, verso blank; contents of the volume, p. iii, verso blank; illustra-
e volume, pp. v–vi; the eight bulletins, pp. 1–830. 8°. 25 plates and 39

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artment of the interior | Bulletins | of the | United States |
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CONTENTS OF BULLETIN 15.

Page.
- General remarks 7
- The Chico-Téjon series 11
- The Shasta group 18
  - Relations of the Shasta group to strata beyond the limits of California 22
  - Relations of the fauna of the auriferous slates to that of the Shasta group 24
  - The geological age of the Aucella-bearing strata of California 26
  - Certain Cretaceous strata which apparently belong between the Shasta and the Chico groups. 27
  - Remarks on certain Californian fossils which have been identified with eastern species 27
  - On the separation of contemporaneous Cretaceous faunas in western North America 30
  - Conclusion 31
- Index 33

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k; text, pp. 9–76 (43–110 of the volume); index, pp. 77–80; explanations
pp. 82, 84, 86 (versos), rectos blank, each explanation facing its plate;
to numbering and binding, outside of back cover. 8°. Plates I–III.

CONTENTS OF BULLETIN 16.

Page.
nsmittal 5
y remarks 9
aphy of the formations 9
c and paleontologic characters of the Genesee beds 13
ne fossils of the Genesee shales of New York 17
c and paleontologic characters of the Naples beds 35
una and flora of the Naples beds 40
c and paleontologic characters of the Portage beds 67
emung beds at High point 72

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the author. Price, 5 cents.

BULLETIN 17.

title: Department of the interior | Bulletin | of the | United
geological survey | no. 17 | On the development of crystalliza-
he igneous | rocks of Washoe Nevada with notes on | the geol-
e district |
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l title: Department of the interior | Bulletin | of the | United
geological survey | no. 17 | [Seal of the department of the
|
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l title: United States geological survey | J. W. Powell director |
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Nevada | with | notes on the geology of the district | by |
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Hague to the director, p. 7, verso blank; text, pp. 9–41 (129–161 of the
erso blank; index, pp. 43–44; notice as to numbering and binding, outside
ver. 8°.

CONTENTS OF BULLETIN 17.

Page.
nsmittal 7
r 9
and augite-andesite 12
nnel section 18
r diorite 21
itic diorite and earlier hornblende-andesite 22
rite and later hornblende-andesite 23
orphyry, dacite, and rhyolite 26
r diabase, black dike, and basalt 27
al and chemical evidence 29
ions 39
.... 43

pies published—3,000 required by the law relating to these bulletins, and
ordered by the authors. Price, 5 cents.

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3,050 copies published—3,000 required by the law relating to these bulletins, and 50 extras ordered by the author. Price, 5 cents.

CONTENTS OF BULLITIN 18.

Page.

The occurrence of Cardita planicosta Lamarck in western Oregon 7

Fossil Mollusca from the John Day group in eastern Oregon 10

  Unionidæ 13

  Helicidæ 14

Supplementary notes on the non-marine fossil Mollusca of North America 17

  Additions 17

  Corrections 18

Index 21

BULLETIN 19.

Cover title: Department of the interior | Bulletin | of the | United States | geological survey | no. 19 | Notes on the stratigraphy of California |
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CONTENTS OF BULLETIN 19.

Page.
ory 7
hic rocks of the Coast ranges 7
metamorphic rocks of the Coast ranges 8
rmity between the Knoxville beds and the Chico 12
f the Mariposa and Knoxville beds 18
f the Cascades to the Sierra and the Coast ranges of California 20
sozoic beds 20
rocks of California 21
ranges members of the western cordillera system 23
.... 27

opies published—3,000 required by the law relating to these bulletins, and as ordered by the author. Price, 5 cents.

BULLETIN 20.

r title: Department of the interior | Bulletin | of the | United
| geological survey | no. 20 | Contributions to the mineralogy
| Rocky mountains |
hington | government printing office | 1885

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|
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cover bearing title as above; advertisement of the publications of the sur- npaged leaves, verso of last one blank; general title as above, verso blank; itle as above, verso blank; letter of transmittal by S. F. Emmons, geologist e, to the director, p. 5, verso blank; contents and illustrations. pp. 7-9, ank; introductory remarks, pp. 11-12; text, pp. 13-109 (231-327 of the vol- erso blank; index, pp. 111-113; explanation of plate, p. 114 (facing the notice as to numbering and binding, outside of back cover. 8°. Plate I, g of 21 figures.

CONTENTS OF BULLETIN 20

Page.
ory remarks 11
als from the basalt of Table mountain, Golden, Colorado, by Whitman Cross and W.
Hillebrand 13
iption of Table mountain 13
Manner of occurrence of the minerals 14
Order of deposition 15
es. First group 15
General 15
aumontite 16
Description 16
Chemical composition 16
ixed zeolites 17
General description 17

I.—Minerals from the basalt of Table mountain, Golden, Colorado, etc.—continued.
Zeolites—continued.
Mixed zeolites—continued.

Page.

Chemical composition 18
Thomsonite spherules 18
Chemical identification 18
Zeolites. Second group 19
Stilbite. ("Desmin" German.) 19
General 19
Crystal form and optical properties 19
Analysis 23
Chabazite 23
General 23
Chemical composition 24
Thomsonite 24
Occurrence and general description 24
Chemical composition 25
Discussion of analyses 26
Relation to "mesole" 26
Analcite 27
General description 27
Optical behavior 27
Chemical composition 29
Apophyllite 29
General description 29
Optical properties 29
Chemical composition 33
Alteration 34
Mesolite 35
General description 35
Chemical composition 35
Natrolite 36
Description and analysis 36
Scolecite 36
Description and analysis 36
Levynite 37
General description 37
Chemical composition 38
Other minerals 38
Bole 38
Description and analysis 38
Calcite 39
Occurrence and description 39
II.—Minerals from the neighborhood of Pike's peak, by Whitman Cross and W. F. Hillebrand 40
General 40
List of species known 40
Mode of occurrence 41
Cryolite 41
Locality 41
Occurrence and association 41
Purely scientific value of the discovery 42
Recent literature of cryolite and its alteration products 43
General description 43
Twin structure 43
Chemical composition 48
Alteration of cryolite 48
Pachnolite 49
From the thin walls 49
From the bluish massive alteration product 50
Crystallographical determinations 50
Chemical investigation 52
Other forms of pachnolite 55
Thomsenolite 55
Occurrence and description 55
Ralstonite 56
Probable identification 56

from the neighborhood of Pike's peak, etc.—continued. Page.
olite, a new mineral 57
antite 58
neral description 58
emical investigation 58
igtokite 61
pite 62
ccurrence 62
ystalline form and physical properties 63
emical investigation 63
..... 66
neral occurrence 66
rcon from the Eureka tunnel 66
ite 67
cite 68
om Crystal park 68
enacite from near Florissant 69
..... 70
ystal park 70
orissant 71
paz from Devil's head mountain 72
..... 73
upon the occurrence of topaz at Devil's head mountain, by W. B. Smith 73
paz 73
icrocline 74
ssiterite 74
uorite 74
lustre exhibited by sanidine in certain rhyolites, by Whitman Cross 75
nidine in rhyolite from Chalk mountain 75
nidine in rhyolite from Ragged mountain 77
evious description of lustre in feldspar 78
stre upon other sanidines 80
nclusion 80
nsual occurrence of topaz, by Whitman Cross 81
ated rare minerals from Utah, by W. F. Hillebrand 83
ivenite 83
nichalcite 84
enevixite 85
hydrous cupri calcium arseniate 86
rosite 86
e massive ore 86
laneous mineral notes, by W. F. Hillebrand 89
llingite 89
  Occurrence 89
  Description 89
  Chemical composition 92
nckenite 93
salite 95
ibnerite 96
ndheimite 97
olinite 98
  Chemical composition 99
chromiferous pseudomorph 99
tive lead 99
ineral species from Colorado, by W. F. Hillebrand 100
nyite 100
itermanite 105
probably new mineral 107

es published—3,000 required by the law relating to these bulletins, and rdered by the authors. Price, 10 cents.

BULLETIN 21.

itle: Department of the interior | Bulletin | of the | United eological survey | no. 21 | The lignites of the great Sioux res-

ervation—a | report on the region between the Grand | and Moreau rivers Dakota |
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CONTENTS OF BULLETIN 22.

	Page.
General remarks	7
Chamidæ	9
Trochidæ	12
Neritidæ	12
Cerithiidæ	13
Soliriidæ	14
Index	15

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BULLETIN 23.

tle: Department of the interior | Bulletin | of the | United
eological survey | no. 23 | Observations on the junction
he Eastern | sandstone and the Keweenaw series on | Kewee-
, | lake Superior |
gtou | government printing office | 1885

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tions | on the | junction between the Eastern sandstone | and
eenaw series | on | Keweenaw point, lake Superior | by |
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ged leaves, verso of last one blank; general title as above, verso blank;
as above, verso blank; contents, p. 5, verso blank; illustrations, pp.
f transmittal by Irving to the director, p. 9, verso blank; text, pp. 11–119
he volume), verso blank; index pp. 121–124; title for vol. III (see below),
; contents for vol. III, p. iii, verso blank; illustrations for vol. III, pp.
e as to numbering and binding, outside of back cover. 8°. Plates
1–26.

CONTENTS OF BULLETIN 23.

PART I. LOCAL DESCRIPTIONS.

	Page.
	11
	12
	23
vine	27
ghton ravine	30
arry	49
ine	54
other points	68

PART II. DISCUSSION OF VIEWS; CONCLUSIONS.

iew	71
d Whitney view	73
iew	86
view	88
iew	91
the authors	98
	121

es published, the number required by the law relating to these bulletins.
nts.

15–23 form vol. III, as follows:

nent of the interior | Bulletins | of the | United States | geo-
rvey | Vol. III | [Seal of the department of the interior] |
gton | government printing office | 1885

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volume, pp. v–vii, verso blank; the nine bulletins, pp. 1–498. 8°. 34
4 figures.

Documentary edition of vol. III as follows:

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BULLETIN 24.

Cover title: Department of the interior | Bulletin | of the | United States | geological survey | no. 24 | List of marine Mollusca comprising the Quaternary | fossils and recent forms from American local- | ities between cape Hatteras and cape | Roque including the Bermudas | Washington | government printing office | 1885

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title: United States geological survey | J. W. Powell direc-
present technical condition | of the | steel industry | of the |
tates | by | Phineas Barnes | [Survey design] |
gton | government printing office | 1885

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ged leaves, verso of last one blank; general title as above, verso blank;
as above, verso blank; contents, p. [5], verso blank; letter of trans-
lbert Williams, jr., geologist in charge, to the director, p. 7, verso blank;
]-82 (345-418 of the volume); index, pp. 83-85; notice as to numbering
g, verso of back cover. 8°.

CONTENTS OF BULLETIN 25.

	Page.
smittal	7
	9
	11
	12
	13
se	13
	13
us	14
als in combination	14
	14
process	15
process	17
rth process	18
	20
	34
	38
ethods	39
	41
	45
ery	46
chinery	49
chinery	51
	65
	70
ods and requirements in testing	72
ations of steel	78
	83

ies published, the number required by the law relating to these bulletins.
nts.

BULLETIN 26.

itle: Department of the interior | Bulletin | of the | United
eological survey | no. 26 | Copper smelting |
gton | government printing office | 1885

l title: Department of the interior | Bulletin | of the | United
eological survey | no. 26 | [Seal of the department of the in-

gton | government printing office | 1885

title: United States geological survey | J. W. Powell, di-
opper smelting | by | Henry M. Howe | [Survey design] |
gton | government printing office | 1885

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ged leaves, verso of last one blank; general title as above, verso blank;

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CONTENTS OF BULLETIN 26.

Page.
Letter of transmittal 9
Introduction 11

I.

Reverberatory method for sulphureted ores 15
  1. Ore roasting 16
    Roasting in heaps or piles 16
    Roasting in stalls 18
    Kiln roasting 18
    Furnaces for fine ore 19
      Hasenclever and Helbig's 19
      Gerstenhöfer's 19
      Maletra's 19
      Spence's 20
      Revolving cylinders 21
      The Stetefeldt furnace 21
      Reverberatory furnaces 21
        Open reverberatories 21
        Muffles 24
        Mechanical reverberatories 24
    Objects of the roasting 25
      a. Oxidation of the iron, and incidentally of the sulphur 25
      b. The expulsion of arsenic and antimony 25
        Pile and stall roasting 26
        Roasting in reverberatories 26
        Comparison of heap and reverberatory roasting 28
  2. Smelting the roasted ore in reverberatories 28
    Furnace construction 28
      Fire box 28
      Fire bridge 29
      Binding 30
      Erection of binding 32
      The masonry 32
      The bottom or hearth 33
      Size and shape of hearth 34
    Chimneys 35
      Draft 35
      Separate chimneys 35
      Central chimneys 36
      Shape 37
      Stability 38
      Iron *vs*. brick chimneys 38
      Linings 38
      Batter 38
    Gas furnaces 39
    Smelting operation 44
    The matte 47
    The slag 47
      In general 47
      Classification 50
      Fusibility, simple silicates 50
      Multiple silicates 50
      Specific gravity 52
      Corrosiveness 52
      Liquidity 52
      Scorification 52
    Chemical reactions 53
      In general 53
      Arsenic and antimony 54

tory method for sulphureted ores—continued. Page.
sting the first matte (coarse metal) 54
ne aim 54
ne operation 56
elting roasted coarse metal for white metal 58
ne aim 58
ne operation 60
emical reactions 61
elting roasted coarse metal for blue metal 62
ne furnaces 62
ne operation 63
oasting-smelting the raw blue metal for regule and bottoms 63
ne aim 63
ne operation 63
emical reactions 64
sting-smelting the raw white metal and regule for blistered copper 66
ne aim 66
ne operation 66
fication of ores and slags 70
es 70
ags 72

II.

tory method for oxidized ores and native copper 73
ing-smelting with carbon 73
ng without carbon 74
rison of the two methods 74

III.

ace process for sulphureted ores 74
al plan 74
roasting 76
smelting 76
general 76
ne deoxidizing effect 80
The average temperature of the ore 80
The proportion of fuel to burden 80
The porosity of the fuel 80
The porosity of the ore 80
The intimacy of mixture 80
The basicity of the mixture 80
The infusibility of the mixture 80
The preponderance of iron oxide 80
Height *vs.* width 81
Sulphides 82
rsenic and antimony 82
olume of furnace 83
achette furnaces 85
isposition of crucible 86
Internal crucibles 86
Crucibles, partly internal, partly external 87
External crucibles 87
ater-jacketed *vs.* brick walls 88
st *vs.* wrought-iron jackets 90
ast, tuyeres, etc 91
ot blast 92
oducts 92
Matte 92
Slag 93
etails of working 94
Mechanical charging 94
Changing tuyeres 95
Filter charging 95
Fine ore 95
sting the first matte 96

Shaft furnace process for sulphureted ores—continued. Page.

4. Smelting the roasted first matte 96
  - Products 98
    - Black copper 98
    - Matte 98
    - Slags 98

IV.

Shaft furnace process for oxidized ores and native copper 99

V.

Comparison of the reverberatory and shaft furnace methods 99
  - Composition of charge 99
  - Labor and fuel 99
  - Arsenic and antimony 100
  - Technical skill 101
  - The first cost of construction 101
  - Repairs 101
  - The loss of copper 101
  - Fines 101
  - Salamanders 101
  - Rapidity 101
  - Size of establishment 102
  - Bringing forward 102

VI.

Résumé 102

ADDENDUM.

Matte roasting in reverberatory furnaces at the Oxford copper and sulphur works 10

3,000 copies published, the number required by the law relating to those bulletins. Price, 10 cents.

BULLETIN 27.

Cover title: Department of the interior | Bulletin | of the | United States | geological survey | no. 27 | Work done in the division of chemistry and physics | mainly during the fiscal year 1884–'85 |
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CONTENTS OF BULLETIN 27.

Page.

Preface 7

Topaz from Stoneham, Me.; by F. W. Clarke 9

On the separation of titanium and aluminum, with a note on the separation of titanium and iron; by F. A. Gooch 16

Page.
ltration by means of easily soluble and easily volatile filters; by F. A. Gooch.... 27
etween electrical resistance and density, when varying with the temper of steel; ns and V. Strouhal.... 30
etween time of exposure, temper-value, and color in oxide films on steel; by C. V. Strouhal. (See bulletins 14 and 35).... 51

MISCELLANEOUS ANALYSES.

Washington, D. C.... 62
the Yellowstone park.... 63
m Newburyport, Mass.... 63
iken, S. C.... 63
ndesite from Bogusloff island, Alaska.... 63
s from New Mexico.... 64
ashoe, Nev.... 65
Washoe, Nev.... 66
dstone.... 66
m Stony point, Mich.... 66
enry county, Illinois.... 66
ys from Wisconsin.... 67
s from Massachusetts.... 68
rom Great salt lake.... 69
tions from Nevada.... 69
Keeney, Kans.... 71
rom a gas-well, Armstrong county, Pennsylvania.... 71
clays from China.... 71
can cement.... 72
e from Timonium, Md.... 72
e from Randolph county, West Virginia.... 73
dolph county, West Virginia.... 72
stone from Randolph county, West Virginia.... 74
Turtle mountains, Dakota.... 74
zona.... 74
atthews' warm springs, Montana.... 75
hite sulphur springs, Montana.... 75
ear Santa Fé, N. Mex.... 75

es published, the number required by the law relating to these bulletins.
nts.

BULLETIN 28.

itle: Department of the interior | Bulletin | of the | United
eological survey | no. 28 | The gabbros and associated horn-
cks | occurring in the neighborhood | of Baltimore, Md. |
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facing); explanation of plate II, p. 64, of plate III, p. 68, of plate IV
each blank, each explanation facing its plate; index, pp. 75–78; notic
ing and binding, outside of back cover. 8°. Plates I–IV, the last o
logical map.

CONTENTS OF BULLETIN 28.

Introduction ....
Summary ....
The limits of the gabbro area near Baltimore and the general character of the rocks c
Petrographical description of the hypersthene-gabbro ....
Petrographical description of the gabbro-diorite ....
Genetic relations of the hypersthene-gabbro and the gabbro-diorite ....
  1. Geological relations of the gabbro and diorite to each other and to the surrou
  2. Chemical relations of the gabbro and diorite ....
  3. Microscopical relations of the gabbro and diorite ....
  4. General conclusions ....
The olivine-bronzite-gabbro, peridotites, and associated serpentines and amphibole
  Baltimore region ....
Index ....

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of the | North American Jurassic |
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verso blank; text, pp. 9–24 (697–712 of the volume); plate explanat
34, 38 (versos), rectos blank, each explanation facing its plate; ind
blank; notice as to numbering and binding, outside of back cover. 8

CONTENTS OF BULLETIN 29.

General remarks ....
Description and citation of species ....
Mollusca ....
Crustacea ....
Index ....

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BULLETIN 30.

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lank; contents for vol. IV, p. iii, verso blank; illustrations for vol.
erso blank; notice as to numbering and binding, outside of back
ates I–XXXIII; figs. 1–10.

CONTENTS OF BULLETIN 30.

Page.
tal 7
rvations 11
strata and faunas referred to the middle Cambrian or Georgia horizon 12
ne Cambrian faunas of North America 59
the name Taconic 65
ents 71
middle Cambrian fauna 72
ins, trails of annelids, etc 72
.... 72
a 94
.... 95
iata 123
.... 125
.... 131
.... 149
eropod from the upper Cambrian or Potsdam horizon 223
.... 357

ublished, the number required by the law relating to these bulletins.

30 form vol. IV, as follows:

t of the interior | Bulletins | of the | United States |
rvey | Vol. IV | [Seal of the department of the interior] |
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e seven bulletins, pp. 1–1095. 8°. 41 plates and 14 figures.
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CONTENTS OF BULLETIN 31.

Letter of transmittal ....

Myriapoda ....

- Bibliography ....
- Characteristics and phylogeny ....
- Table showing geological distribution ....
- 1. Order Protosyngnatha Scudder ....
- 2. Order Chilopoda Latreille ....
- 3. Order Archipolypoda Scudder ....
- 4. Order Diplopoda Gervais ....

Arachnida ....

- Bibliography ....
- Characteristics and geological history ....
- Table showing geological distribution ....
- 1. Order Acari Leach ....
- 2. Order Chelonethi Thorell ....
- 3. Order Anthracomarti Karsch ....
- 4. Order Pedipalpi Latreille ....
- 5. Order Scorpiones Thorell ....
- 6. Order Opiliones Sundevall ....
- 7. Order Araneæ Sundevall ....

Page.
.... 32
.... 32
s and development 34
yoptera Goldenberg 36
phy 36
Orthopteroidea Scudder 38
Neuropteroidea Scudder 41
Hemipteroidea Scudder 45
Coleopteroidea Scudder 45
abola Packard 46
rthoptera Olivier 46
graphy 46
europtera Linné 51
graphy 51
emiptera Linné 58
graphy 58
oleoptera Linné 65
graphy 65
ackard 85
iptera Linné 85
graphy 85
epidoptera Linné 94
graphy 94
ymenoptera Linné 96
graphy 96
bution of fossil insects 102
g the geological distribution of insects 110
arative distribution of extinct and existing orders 111
istories of Myriapoda, Arachnida, and Hexapoda 111
ng the chronological range of presumed ancestral and extinct stocks 113
.... 115

ublished, the number required by the law relating to these bulletins.

BULLETIN 32.

: Department of the interior | Bulletin | of the | United
ogical survey | no. 32 | Mineral springs of the United

n | government printing office | 1886

le: Department of the interior | Bulletin | of the | United
ogical survey | no. 32 | [Seal of the department of the inte-

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reliminary study) | by | Albert C. Peale, m. d. | [Survey

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States | geological survey | no. 33 | [Seal of the depa
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volume), verso blank; index, p. [23], verso blank; notice as to
binding, outside of back cover. 8°.

CONTENTS OF BULLETIN 33.

Letter of transmittal ....
Introductory ....
General topographic divisions of northern California and Oregon..........
Character and distribution of the carboniferous limestone..................
Structure of the Sierra nevada range..................................
Age of the faulting of the Sierra nevada range..........................
Age of the auriferous slates..
General distribution of the metamorphic, volcanic, and Cretaceous rocks........
Relation of the Sierra, Coast, and Cascade ranges........................
Conclusions ....
Index..

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other groups |
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States | geological survey | no. 34 | [Seal of the depart
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CONTENTS OF BULLETIN 34.

Page.
marks 9
n of species 20
.... 20
idæ 20
idæ 21
idæ 22
læ 24
idæ 26
dæ 26
æ 27
asiidæ 28
dæ 30
ridæ 31
.... 32
læ 33
.... 53

opies published, the number required by the law relating to these bulleice, 10 cents.

BULLETIN 35.

r title: **Department of the interior | Bulletin | of the | United | geological survey | no. 35 | Physical properties of the ironets |**
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CONTENTS OF BULLETIN 35.

Letter of transmittal
The internal structure of tempered steel
  Introduction
  Apparatus
  Experimental results
  Discussion
  Conclusion
The color effect produced by slow oxidation of iron-carburets
  Data for high temperature
  Data for low temperature
Index

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in liquids |
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numbering and binding, outside of back cover. 8°. Figures 1-

CONTENTS OF BULLETIN 36.

General relations of the phenomenon of subsidence
  Introductory
  General inferences
    Analogies
    The physical variables
  Stratification
    Analogies
    Descriptive equation
    Effect of density of mixture
    Sharp demarkation
  Temperature
    Chemical effect
    Physical effect
  Precipitants
    Chemical effect
    Physical effect
    Experimental results
  Discussion

the phenomenon of subsidence—continued. Page.
relations.. 33
lations.. 35
larger dimensions.. 36
and viscosity.. 38
.... 39
rate of subsidence on order of surface, concentration, and turbidity 41
esults... 41
y.. 41
.... 42
.... 48
different orders... 48
n.. 49
.... 50
on battery... 50

blished, the number required by the law relating to these bulletins.

form vol. v, as follows:

of the interior | Bulletins | of the | United States | geo-
| Vol. v | [Seal of the department of the interior] |
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346 inclusive) was evidently an allowance by the printer for 57 le 57 accompanying leaves of plate explanations, but the plates w with explanations on separate leaves.

CONTENTS OF BULLETIN 37.

- Explanatory remarks
- Description of the species

CRYPTOGAMS.

- Algæ
  - Fucus
  - Spiraxis

PHANEROGAMS.

- Gymnosperms
  - Coniferæ
    - Ginkgo
    - Sequoia
- Angiosperms
  - Monocotyledons
    - Gramineæ
      - Phragmites
    - Lemnaceæ
      - Lemna
    - Typhaceæ
      - Sparganium
  - Dicotyledons
    - Apetalæ
      - Salicineæ
        - Populus
      - Cupuliferæ
        - Quercus
        - Dryophyllum
        - Corylus
        - Alnus
        - Betula
      - Myricaceæ
        - Myrica
      - Juglandaceæ
        - Juglans
        - Carya
      - Platanaceæ
        - Platanus
      - Urticaceæ
        - Ficus
        - Ulmus
      - Laurineæ
        - Laurus
        - Litsæa
        - Cinnamomum
        - Daphnogene
      - Monimiaceæ
        - Monimiopsis
    - Polypetalæ
      - Cornaceæ
        - Nyssa
        - Cornus
      - Araliaceæ
        - Hedera
        - Aralia
      - Onagrarieæ
        - Trapa
      - Hamamelideæ

inued. Page.
namelites 64
nosæ 65
uminosites 65
ceæ 65
r 65
ndus 66
leæ 69
s 69
æ 72
hemia 72
phus 73
irus 75
neæ 77
strus 77
aymus 82
odendron 83
.... 85
via 85
viopsis 88
ceæ 93
ospermites 93
aceæ 96
neria 96
rmaceæ 100
ulus 100
ceæ 102
dendron 102
nolia 103
.... 104
e 104
pyros 104
aceæ 106
rnum 106
.... 347

lished, the number required by the law relating to these bulletins.

BULLETIN 38.

Department of the interior | Bulletin | of the | United
ical survey | no. 38 | Peridotite of Elliott county, Ken-

| government printing office | 1887

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ical survey | no. 38 | [Seal of the department of the in-

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tite | of | Elliott county, Kentucky | by | J. S. Diller |
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aves, verso of last one blank; general title as above, verso blank;
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, pp. 9–29 (363–383 of the volume), verso blank; index, p. 31, verso
to numbering and binding, verso of back cover. 8°. Plate I;

CONTENTS OF BULLETIN 38.

Introduction
Distribution and mode of occurrence
Mineralogical composition and structure
Relations and origin of the peridotite
Chemical composition
Loose fragments of feldspathic rocks found with the peridotite
Age of the peridotite
Summary
Index

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Cover title: Department of the interior | Bulletin |
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vey, 2 unpaged leaves, verso of last one blank; general title as ab
special title as above, verso blank; contents and illustrations,
letter of transmittal to the director by T. C. Chamberlin, geolo
glacial division, p. 7, verso blank; text, pp. 9–79 (395–465 of t
blank; index, pp. 81–84; notice as to numbering and binding, outs
8°. Plate I; figs. 1 and 2.

CONTENTS OF BULLETIN 39.

Introduction:
    The upper or Herman beach
    The Norcross beach
    The Campbell beach
    The McCauleyville beach
    The Red river valley
    The outlet of lake Agassiz
    The northern barrier
    Area and depth of lake Agassiz
    Elevations of the crests of the beaches of lake Agassiz
The upper or Herman beach in Minnesota:
    From lake Traverse east to Herman
    From Herman north to the Red river
    From the Red river north to Muskoda
    Delta of the Buffalo river
    From Muskoda north to the Wild rice river
    From the Wild rice river north to Maple lake
The upper or Herman beach in Dakota:
    From lake Traverse northwest to Milnor
    From Milnor north to Sheldon
    From Sheldon north to the northern Pacific railroad

Herman beach in Dakota—continued. Page.
northern Pacific railroad north to Galesburg.. 48
sburg north to Larimore.. 51
t of the Elk and Golden valleys... 57
d islands east of the Elk and Golden valleys... 64
ler north to the Tongue river.. 72
e Pembina river.. 74

es published, the number required by the law relating to these bulle-
, 10 cents.

BULLETIN 40.

tle: Department of the interior | Bulletin | of the | United
ological survey | no. 40 | Changes in river courses in Wash-
ritory | due to glaciation |
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BULLETIN 41.

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eological survey | no. 41 | [Seal of the department of the

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n | the fossil faunas | of the | upper Devonian | the Gen-
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al, pp. 9-10; introduction, pp. 11-13, verso blank; text, pp. 15-104 (495-
olume); half-title "Plates," p. 105, verso blank; plates I and II, pp.

[107-110]; explanation of plate III, p. 112, recto blank; plate III,
explanation of plate IV, p. 116, recto blank; plate IV, pp. [117-118];
123, verso blank; title for vol. VI, verso blank; contents for vol.
blank; illustrations for vol. VI, pp. V-VII, verso blank; notice as to
binding, outside of back cover. 8°. Plates I-IV.

CONTENTS OF BULLETIN 41.

Introduction
Review of opinions; the bearings of these investigations upon the classification o
Devonian rocks and faunas
Prof. James Hall's views
Prof. A. Winchell's views
Views on the relation of the Waverly to the New York series
Views of the Pennsylvania geologists
The Allegany county section
Order of deposits in Ohio
Geographical and chronological relations of the faunas
List of the faunas
Relation of the faunas to the character of the deposits
Relation of the black shales to the upper faunas
Place of the Venango oil group
Strata following the Chemung faunas
The interpretation of the facts
Faunas of the Genesee shale and the Portage groups
Description of two new lamellibranchs
Description of *Lunulicardium levis*
Description of two new *Lucinas*
Description of worm tracks
The Portage sandstones and the faunas of the Chemung group
Description of fish remains
The upper Chemung—the sands and the conglomerates
Description of *Rhynchonella Allegania*
Conclusions

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verso blank; the five bulletins, pp. 1-603. 8°. 67 plates and 10 figur

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BULLETIN 42.

Department of the interior | Bulletin | of the | United
gical survey | no. 42 | Report of work done in the division
| and physics mainly during the fiscal year 1885–'86 |
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e: Department of the interior | Bulletin | of the | United
gical survey | no. 42 | [Seal of the department of the in-

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work done | in the | division of chemistry and physics |
the | fiscal year 1885–'86 | F. W. Clarke, chief chemist |
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leaves; general title as above, verso blank; special title as above,
ntents, pp. 5–6; illustrations, p. 7, verso blank; preface, p. 9, verso
11–149, verso blank; index, pp. 151–152; notice as to numbering
tside of back cover. 8°. Plate I; figs. 1–10.

CONTENTS OF BULLETIN 42.

SCIENTIFIC PAPERS.

Page.
ithia micas. By F. W. Clarke 11
tes of Maine 11
nia micas of cape Ann 21
chfield, Maine. By F. W. Clarke 28
.... 28
.... 29
.... 30
.... 31
lomelane 34
rmulæ 35
Mexico. By F. W. Clarke and J. S. Diller 39
contacts of Corundum hill, North Carolina, in relation to the origin of corun-
omas M. Chatard 45
.... 46
he sections 48
ts 49
.... 61
paration and estimation of boric acid, with an account of a convenient form
or quantitative distillations. By F. A. Gooch 64
paration of sodium and potassium from lithium by the action of amyl alcohol
es, with some reference to a similar separation of the same from magnesium
By F. A. Gooch 73
ion of chlorine, bromine, and iodine by the electrolysis of their silver salts,
nts on the convertibility of the silver salts by the action of alkaline haloids.
Whitfield 89
c irons and an iron of doubtful nature. By R. B. Riggs 94
ls meteorite 94
.... 95
tful nature 96
cooling exhibited by glass and by steel. By C. Barus and V. Strouhal 98
imparted by sudden cooling, and its relations to temperature 98
imparted by sudden cooling, and its structural relations 112
-electric effect of temper 121
marks 129
of lampblack. By William Hallock 132

MISCELLANEOUS ANALYSES.

The peridotite of Elliott County, Kentucky
Trenton limestone from Lexington, Virginia
Residual deposit from the subaërial decay of chloritic schist from eight mi
North Carolina
Decomposed trap from North Carolina
Altered feldspar from Laurel creek, Georgia
Ferruginous rock from Penokee iron range, Wisconsin
Two rocks from Kakabikka falls, Kaministiquia river, Ontario
Mica andesite from a cañon on the east side of San Mateo mountain, New Mex
Hypersthene andesite from San Francisco mountains, Arizona
Basalt from six miles northeast of Grant, New Mexico
Fulgurite from Whiteside county, Illinois
Blue and buff limestones from Bedford, Indiana
Yellow sandstone from Armejo quarry, Colorado
Eight samples of volcanic dust
Loess and clays
Iron ores from Louisiana
"Natural coke" from Midlothian, Virginia
Coal from Jefferson county, West Virginia
Three coals from Gulf, North Carolina
Coal from Walnut cove, North Carolina
"Natural coke" from Purgatory cañon, New Mexico
Two springs, one mile from Farmwell station, Loudoun county, Virginia
Two artesian wells, Story city, Iowa
Beck's hot springs, near Salt lake city, Utah
Water of Mono lake, California

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BULLETIN 43.

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States | geological survey | no. 43 | On the Tertiary
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States | geological survey | no. 43 | [Seal of the de
interior] |
Washington | government printing office | 1887

Special title: United States geological survey | J
rector | Tertiary and Cretaceous strata | of the | Tus
bee, and Alabama rivers | by | Eugene A. Smith | an
Johnson | [Survey design] |
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vey, 2 unpaged leaves; general title as above, verso blank; sp
verso blank; contents, pp. 5-8; illustrations, p. 9, verso blan
mittal, by Eugene A. Smith, state geologist of Alabama, p. 11, v
signed Eugene A. Smith, pp. 13-14; text, pp. 15-138 (167-290 of
title "Plates XII-XXI, with explanations," p. 139, verso blank; p
explanations on separate leaves, pp. 141-184; index, pp. 185-189,
as to numbering and binding, outside of back cover. 8°. Plate

CONTENTS OF BULLETIN 43.

Page.
.... 13
n.. 15
ata:
lte limestone.. 19
iborne... 25
rstone... 34
itic... 38
y of the leading features of the Tertiary strata of Alabama.......... 68
strata:
ley formation.. 71
en limestone... 83
taw formation.. 86
zoic strata, probably Cretaceous:
caloosa formation.. 95
the leading features of the Cretaceous strata of Alabama:
ous strata... 116
f undetermined age, probably Cretaceous.............................. 117
s and faults in the Tertiary and Cretaceous strata of Alabama:
y strata... 117
ous strata... 131

mations.. 133
esis of the formations... 136

pies published, the number required by the law relating to these bulletins.
cents.

BULLETIN 44.

title: Department of the interior | Bulletin | of the | United
geological survey | no. 44 | Bibliography of North American
for 1886 |
ington | government printing office | 1887

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geological survey | no. 44 | [Seal of the department of the in-

ington | government printing office | 1887

l title: United States geological survey | J. W. Powell, direc-
bliography | of | North American geology for 1886 | by | Nelson
on | [Survey design] |
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geological survey | no. 45 | Present condition of knowledge of
ology of Texas |
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States | geological survey | no. 45 | [Seal of the depart
terior] |
Washington | government printing office | 1887

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rector | The | present condition of knowledge | of
Texas | by | Robert T. Hill | [Survey design] |
Washington | government printing office | 1887

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CONTENTS OF BULLETIN 45.

- Prefatory note

I. HISTORIC STATEMENT OF GEOLOGIC INVESTIGATIONS.

- Knowledge at the beginning of this century
- Anglo-American adventurers and colonists
  - Philip Nolan
  - American colonization period
- European investigators
  - William Kennedy
  - G. A. Scherpf
  - Prince Carl Solms-Braunfels
  - Victor Bracht
  - Ferdinand Roemer
- United States military reconnaissances and explorations
  - Reconnaissances
  - Explorations
    - Exploration of the Red river of Louisiana
    - United States and Mexican boundary survey
    - Pacific railroad survey
      - Thirty-fifth parallel survey
      - Thirty-second parallel survey
    - Artesian well experiment
- Geologic surveys conducted by the state
  - The Texas land office
  - First geological survey (Shumard)
    - Organization and equipment
    - Field labors
    - Methods of survey
    - Maps
    - Operations of 1860
    - Official results
    - Indirect results
    - Expense
  - Second geological survey (Glenn-Buckley)
    - Operations of 1874
    - Operations of 1875
- Recent miscellaneous investigations
  - Individual contributors
  - Work of the United States geological survey
- Succession of scientific explorations

II. SUMMARY OF RESULTS.

- Topography
  - Classification of topography of Texas
  - Chart illustrating progressive classification of topographic features

II. SUMMARY OF RESULTS—continued.

Page.
y and stratigraphy 53
ologic formations of Texas, with authorities 54
rchean and earlier Paleozoic 55
us system 57
Carboniferous area 58
ecos Carboniferous area 59
conclusions respecting the Texas Carboniferous 62
rmian or Permo-Carboniferous 62
ecos region of Shumard 63
of Cope and his assistants 65
r gypsum strata 69
rassic 70
71
ramie 84
84
and other post-Tertiary strata 86
eductions 87
ions 88

published, the number required by the law relating to these bulletins.
s.

BULLETIN 46.

le: Department of the interior | Bulletin | of the | United
logical survey | no. 46 | The nature and origin of deposits
ate of lime |
on | government printing office | 1888

tle: Department of the interior | Bulletin | of the | United
logical survey | no. 46 | [seal of the department of the

on | government printing office | 1888.

tle: United States geological survey | J. W. Powell, di-
ure and origin | of | deposits of phosphate of lime | by |
nrose, jr. | with an | introduction by N. S. Shaler | [Survey

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contents, p. 5, verso blank; illustrations, pp. 7–8; introduction, by N.
9–20; text, pp. 21–127, (495–601 of the volume), verso blank; bibliog-
9–140; index, pp. 141–143, verso blank; title for volume VII, verso
ts for vol., VII, p. iii, verso blank; illustrations for vol. VII. pp. v–vii,
otice as to numbering and binding, outside of back cover. 8°. Plates
6.

CONTENTS OF BULLETIN 46.

Page.
N. S. Shaler 9
osphate of lime in nature 21
eposits of phosphate of lime 21
es 22
22
of Canada 23
of Norway 42
of Spain 45

Mineral phosphates—continued:
- Phosphorites
  - Phosphorites of Nassau
  - Phosphorites of southwestern France
  - Phosphorites of Spain

Rock phosphates
- Amorphous nodular phosphates
  - Amorphous nodular phosphates of South Carolina
  - Amorphous nodular phosphates of North Carolina
  - Amorphous nodular phosphates of Alabama
  - Amorphous nodular phosphates of Martha's vineyard
  - Amorphous nodular phosphates of Florida
  - Amorphous nodular phosphate deposits of north Wales
  - Amorphous nodular phosphate deposits of England
    - Phosphate beds of Cretaceous upper greensand
    - Phosphate beds of Cretaceous lower greensand
    - Tertiary phosphate beds
    - History of the rock phosphates of England
  - Phosphates of Belgium
  - Phosphates of northern France
  - Phosphates of central France
  - Phosphates of Russia
- Phosphatic limestone beds
  - Phosphatic limestones of Kentucky
- Guanos
  - Soluble guanos
  - Leached guanos
- Bone beds
  - Cave deposits
  - Lacustrine deposits

Bibliography

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verso blank; the five bulletins, pp. 1–617. 8°. 25 plates and 47

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national | park, with an account of the methods | of analysis
ed |
hington | government printing office | 1888
ral title: Department of the interior | Bulletin | of the | United
| geological survey | no. 47 | [Seal of the department of the in-
|
hington | government printing office | 1888
al title: United States geological survey | J. W. Powell, direc-
nalyses of waters | of the | Yellowstone national park | with an
t of the methods of analysis employed | by | Frank Austin
| and | James Edward Whitfield | [Survey design] |
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npaged leaves; general title as above, verso blank; special title as above,
ank; contents and illustrations, pp. 5–6; letter of transmittal, by F. W.
chief chemist, p. 7, verso blank; text, pp. 9–81, verso blank; folded table
ng a "Summary of analyses;" index, pp. 83–84; notice as to numbering and
outside of back cover. 8^{c}. Figures 1 and 2.

CONTENTS OF BULLETIN 47.

Page.
transmittal 7
ion 9
s in the field 10
s in the laboratory 11
t of natural waters 12
ic gravity 12
gen sulphide and free sulphur 13
urous acid 13
uric acid 13
and nitrous acids 14
nic acid 15
ious acid and boric acid 17
ne (with bromine and iodine) 20
iron and aluminum, calcium, and magnesium 21
n, potassium, and lithium 22
nia and albuminoid ammonia 25
t of concentrated waters 25
gth of the concentrated waters 25
nent of the residue 26
ne 26
n and strontium 26
horic acid 27
anese 27
.... 28
c acid 28
t of the aqueous solution 29
and bromine 29
m 30
m, rubidium, and thallium 31
ic, antimony, tin, copper, and lead 31
acid 33
of the results of analysis 33
.... 36
tra spring 36
e spring 38
iver 39
ner river 40
ner river 41
supply at Mammoth hot springs 42
spring 43

Analyses—continued.
- Fearless geyser
- Pearl geyser
- Constant geyser
- Coral spring
- Coral spring
- Echinus spring
- Schlammkessel
- Fountain geyser
- Great fountain geyser
- Hygeia spring
- Madison spring
- Firehole river
- Excelsior geyser
- Old faithful geyser
- Splendid geyser
- Splendid geyser
- Giantess geyser
- Beehive geyser
- Grotto geyser
- Turban and Grand geysers
- Artemisia geyser
- Taurus geyser
- Asta spring
- Bench spring
- Firehole river
- Yellowstone lake
- Alum creek
- Chrome spring
- Mush pot spring
- Devil's ink pot
- Soda butte spring

Summary of analyses

Index

3,000 copies published, the number required by the law relating
Price, 10 cents.

BULLETIN 48.

Cover title: Department of the interior | Bulletin |
States | geological survey | no. 48 | On the form and po
level |

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States | geological survey | no. 48 | [Seal of the dep
interior] |

Washington | government printing office | 1888

Special title: United States geological survey | J.
rector | On the form and position | of | the sea leve
reference to its dependence on superficial | masses sy
posed about a normal | to the earth's surface | by | F
Woodward | [Survey design] |

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vey, 2 unpaged leaves; general title as above, verso blank; spec
verso blank; contents, pp. 5–7, verso blank; key to mathematical
verso blank; letter of transmittal, p. 13, verso blank; text pp. 1
volume); index, pp. 87–88; notice as to numbering and binding
cover. 8°.

CONTENTS OF BULLETIN 48.

Page.
cal symbols 9
tal 13
ion 15
and dimensions of sea-level surface of earth. Close approximation of oblate
roid. Relation of actual sea surface or geoid to spheroidal surface. A knowl-
required of form of geoid by geodesy, of variations in form and position by
gy. Difficulties in way of improved theory 15
f problems discussed in this paper 16
mé of results attained 17

A. THEORY.

ical statement of problem 18
mental principle and equation 18
sions of earth's ellipsoid and sphere of equal volume 19
tion of equation of disturbed surface 19
of potential of disturbing mass of uniform thickness 21
nination of potential in terms of rectangular and polar coördinates 21
ormation and reduction to single integration of elliptic forms 22
sion and further transformation 24
values of the integrals and corresponding values of the potential 25
a point of the disturbed surface at the center of the disturbing mass 25
a point of the disturbed surface at the border of the disturbing mass 25
a point of the disturbed surface 180° from the center of the disturbing mass. 26
ential of a spherical shell 26
pproximation of the expressions for the potential of the disturbing mass 26
xpression for potential of complete spherical shell 26
of approximation of expression for potential at center of disturbing mass 27
of approximation of expression for potential at border of disturbing mass 28
of approximation of expression for potential at point 180° from center of dis-
bing mass 30
nt of potential of disturbing mass in series of spherical harmonics 30
s on expressions for potential previously derived and on those to be consid-
..... 30
ion of potential function in series and integration of separate terms 31
ion and derivation of approximate forms. Harmonic development of elliptic
grals I_1 and I_2 34
rranged free water 35
on difficulty of obtaining exact expression for effect of rearranged free
r. Derivation of expression for an effect which will exceed probable actual
t 35
of constants V_0 and U_0 in equation to disturbed surface 37
nt of principle involved in determination of constants V_0 and U_0 and their
uation 37
es of V_0 and U_0 found by means of property of spherical harmonics 38
e of V_0 found by direct integration 38
f disturbed surface 40
ns of disturbed surface when effect of rearranged water is neglected and
n that effect is considered 40
on of equations 41
values of the elevation of the disturbed surface at the center, at the border,
180° from the center of the disturbing mass 41
radial extent of masses of uniform thickness requisite to produce maxi-
elevation of disturbed surface 42
rearranged free water 42
of the definite integrals I_1 and I_2 43
on of I_1 in series 43
on of I_2 in series 45
al expansion of I_2 for case when attracted point is near border of attracting
..... 46
urbed surface 47
on of expressions for slope of disturbed surface 47
f these expressions in special case of slope at border of disturbing mass 47
on of expression for slope at border of disturbing mass 48

A. THEORY—continued.

XI.—Disturbed center of gravity of earth ....
    31. Centers of surfaces of reference appropriate for different purpo
        modifications of preceding formulas when disturbed center of g
        surface of reference ....
XII.—Equations of disturbed surface when disturbing mass is of variable th
    32. Desirability of extending the investigation to more complex distu
    33. Derivation of expression for effect of any mass symmetrically
        radial axis, and application to a class of mass-forms ....
    34. Evaluation of a definite integral needed in applications of sequel ..
    35. Elevation of disturbed surface at the center, at the border, and
        from the center of the disturbing mass in the case of the above cla
    36. Slope of disturbed surface..............................
    37. Effect of rearranged free water..............................
    38. Remark on a property of certain formulas of this article..........

B. APPLICATIONS.

XIII.—Relative positions of level or equipotential surfaces in a lake basin ...
    39. Solution of problem stated in section 2 (*a*) ....
    40. Illustrative numerical example..............................
    41. Inference from preceding solution ....
XIV.—Variations in sea level attributable to continental glaciers or ice caps
    42. Statement of problem, and brief consideration of the first of two di
    43. Consideration of second difficulty..............................
    44. Data assumed for calculation ....
    45. Definition of forms of assumed masses..............................
    46. Information as to actual forms of the ice caps, and reasons for con
        forms adequate ....
    47. Computation of the volumes of the assumed masses and equivalen
        level ....
        Table of results..............................
    48. Remark on the magnitudes of the masses of the assumed ice caps in
        the earth's mass..............................
    49. Computation of position and slope of disturbed surface..............
        Table of results..............................
    50. Estimate of the effect of the rearranged free water and discussion
    51. Minimum thicknesses of ice masses of varying radial extent req
        average slopes of 5 feet per mile within 1° of their borders ......
        Table of results..............................
    52. Variations in sea level due to alternation of glaciation at the poles
        Table of results..............................
        Graphical representation ....
XV.—Historical note..............................
    53. Reference to discussions and investigations of previous writers or
        glacial accumulation in disturbing the sea level..................
    54. Investigations of Archdeacon Pratt ....
    55. Numerical calculations of Pratt..............................
    56. Test of the correctness of Pratt's formula..............................
    57. Investigations of Mr. D. D. Heath..............................
    58. Verification of a numerical example in Heath's work..............
    59. Heath's criticism of Croll and Pratt ....
    60. Contribution of Sir William Thomson; proofs of Thomson's formul
    61. Verification of his numerical example..............................
    62. Remarks on the results obtained by different writers and tabular
        data employed by them..............................
        Table of data used ....
XVI.—Variations in sea level attributable to continental masses ....
    63. Two hypotheses relative to the nature of the earth's crust ....
    64. Assumptions adopted in accordance with first hypothesis ....
    65. Data for and methods of computation..............................
        Table of results..............................
    66. Graphical representation of results ....
    67. Elevation of disturbed surface at the border of the continent.......
    68. Remarks on the resultant action of the continents ....

B. APPLICATIONS—continued.

Page.
in sea level attributable to continental masses—continued.
ions of the plumb-line along the border of the continent 83
eration of the effect on the sea level of the continents under the conditions of
econd hypothesis 83
ion of the plumb-line 85
thors consulted 85
s, titles of their works, and dates of publication 85, 86

ublished, the number required by the law relating to these bulletins.

BULLETIN 49.

: Department of the interior | Bulletin | of the | United
ogical survey | no. 49 | Latitudes and longitudes of certain
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ogical survey | no. 49 | [Seal of the department of the inte-

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es and longitudes | of | certain points in Missouri, Kansas,
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f transmittal, p. [7], verso blank; text, pp. 9–133 (181–305 of the
as to numbering and binding, outside of back cover. 8°.

CONTENTS OF BULLETIN 49.

Page.
ions 9
alls, and Fort Scott, Kans.; Springfield and Bolivar, Mo.; Albuquerque, N.
.... 9
strumental constants 11
ed at Saint Louis and their constants 11
ed at the field stations and their constants 11
s of determination of constants of field instruments 12
.... 20
rvation; selection of stars; table of results 20
results from different pairs of stars by weights; table of definitive results 32
.... 39
e determination 39
tion 39
.... 41
work 42
on 43
ctions and rates 112
ences of longitude 115
arent and true differences of longitude and systematic errors 120
ngitude differences uncorrected for personal and instrumental equation 121
personal equation 123
nes; arrangement of circuits; instrumental equation 128
ions for personal and instrumental equation 130
des 130
al positions 132
ographical positions 132

3,000 copies published, the number required by the law relatin
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BULLETIN 50.

Cover title: Department of the interior | Bulletin |
States | geological survey | no. 50 | Formulas and ta
the construction | and use of maps. |
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States | geological survey | no. 50 | [Seal of the de
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blank; letter of transmittal, p. 7, verso blank; text, pp. 9–124 (31
notice as to numbering and binding, outside of back cover. 8°.

CONTENTS OF BULLETIN 50.

Theory of the tables
- Adopted spheroid and constants thereof
- Principal radii of curvature
- Lengths of arcs of meridian
- Lengths of arcs of parallels
- Coördinates for the polyconic projection of maps
- Areas of zones and quadrilaterals of the earth's surface

Explanation of use of tables
Tables
- Table I, logarithms of radius of curvature of meridian
- Table II, logarithms of radius of curvature of normal section
- Table III, lengths of arcs of meridian
- Table IV, lengths of arcs of parallels
- Table V, co-ordinates for map projection on scale 1:250000
- Table VI, co-ordinates for map projection on scale 1:126720
- Table VII, co-ordinates for map projection on scale 1:125000
- Table VIII, co-ordinates for map projection on scale 1:63360
- Table IX, co-ordinates for map projection on scale 1:62500
- Table X, co-ordinates for map projection on scale 1:31680
- Table XI, co-ordinates for map projection on scale 1:30000
- Table XII, areas of quadrilaterals of the earth's surface of 1° extent in tude
- Table XIII, areas of quadrilaterals of the earth's surface of 30′ extent in tude
- Table XIV, areas of quadrilaterals of the earth's surface of 15′ extent in tude
- Table XV, areas of quadrilaterals of the earth's surface of 10′ extent in tude
- Table XVI, actual intervals corresponding to 0.01 inch on maps of variou

Miscellaneous constants

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BULLETIN 51.

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geological survey | no. 51 | On invertebrate fossils from the
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geological survey | no. 51 | [Seal of the department of the in-

ington | government printing office | 1889

l title: United States geological survey | J. W. Powell, di-
On | invertebrate fossils | from | the Pacific coast | by |
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ume); half-title "Plates," p. 71, verso blank; half-titles of individual
rectos) and explanations of the same (on versos), 14 leaves paged 73-100,
facing its explanation; index, pp. 101-102; notice as to numbering and
utside of back cover. 8°. Plates I-XIV.

CONTENTS OF BULLETIN 51.

Page.
nsmittal........ 9
fossil Mollusca from the Chico-Téjon series of California........ 11
remarks........ 11
ion of species........ 14
hifera........ 14
Ostreidæ........ 14
Pholadidæ........ 15
eropoda........ 15
Actæonidæ........ 15
Fissurellidæ........ 16
Stomatellidæ........ 17
Trochidæ........ 17
Naticidæ........ 19
Aporrhaidæ........ 19
Turritellidæ........ 20
Melanopsidæ........ 20
Rissoidæ........ 21
Muricidæ........ 21
Buccinidæ........ 22
Fasciolariidæ........ 22
Volutidæ........ 23
Cancellariidæ........ 25
Pleurotomidæ........ 25
alopoda........ 26
Ammonitidæ........ 27
ivalents of the Chico-Téjon series in Oregon and Washington........ 28
remarks........ 28
s in southern, central, and eastern Oregon........ 29
near Dwamish river, in Washington........ 30
near Astoria, Oregon........ 31
etaceous fossils from Vancouver island region........ 33
remarks........ 33

Part III. Cretaceous fossils from Vancouver island region—continued.
- Annotated list and description of species
  - Brachiopoda
    - Rhynchonellidæ
  - Conchifera
    - Ostreidæ
    - Anomiidæ
    - Aviculidæ
    - Mytilidæ
    - Arcidæ
    - Trigonidæ
    - Crassatellidæ
    - Lucinidæ
    - Veneriidæ
    - Mactridæ
    - Pholadomyidæ
    - Anatinidæ
    - Teredinidæ
  - Gasteropoda
    - Dentaliidæ
    - Ringiculidæ
    - Trochidæ
    - Scalariidæ
    - Naticidæ
    - Neritopsidæ
    - Fasciolariidæ
    - Volutidæ
  - Cephalopoda
    - Baculitidæ
    - Ammonitidæ

Part IV. Molluscan fauna of the Puget group
- General remarks on the geology of the group
- Description of species
  - Conchifera
    - Cardiidæ
    - Cyrenidæ
    - Tellinidæ
    - Teredinidæ
  - Gasteropoda
    - Neritidæ
    - Cerithiidæ
- Concluding remarks on the fauna

Part V. Mesozoic Mollusca from the southern coast of the Alaskan peninsula
- General remarks
- Description of species
  - Conchifera
    - Arcidæ
    - Saxicavidæ
  - Cephalopoda
    - Belemnitidæ
    - Ammonitidæ

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States | geological survey | no. 52 | [Seal of the depa
terior] |

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ërial decay of rocks | and | origin of the red color of cer-
ns | by | Israel Cook Russell | [Survey design] |
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88 of the volume); bibliography, pp. 57-61, verso blank; index, pp.
to numbering and binding, outside of back cover. 8°. Plates I-V.

CONTENTS OF BULLETIN 52.

Page.
.... 11
ocks 12
stalline rocks of the Piedmont region 12
ks of the Newark system 15
ks of the southern Appalachians 18
ks of the great Appalachian valley 20
yed rocks in the arid region of the far West 26
in other countries 28
ing the decay of rocks 30
ically recent orographic movement on the distribution of residual deposits
hian region 34
ions of rocks 37
f residual clays 39
cts of residual clays 43
or of certain formations 44
posed 44
ses 47
.... 55
.... 56
.... 57

lished, the number required by the law relating to these bulletins.

BULLETIN 53.

Department of the interior | Bulletin | of the | United
ical survey | no. 53 | The geology of Nantucket |
| government printing office | 1889

Department of the interior | Bulletin | of the | United
ical survey | no. 53 | [Seal of the department of the

| government printing office | 1889

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eology of Nantucket | by | Nathaniel Southgate Shaler |
] |
| government printing office | 1889

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he volume); index, p. 55; notice as to numbering and binding,
ver. 8°. Plates I-X; figs. 1-16.

CONTENTS OF BULLETIN 53.

Prefatory note..
General form of Nantucket ....
General geological structure...
Origin of the detrital materials ....
Fossiliferous deposits...
  Fossiliferous deposits of Sankaty head ....
Succession of geological events ....
Post-glacial changes of Nantucket......................................
Recent changes on the coast of Nantucket ....
Vegetation of Nantucket ....

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of high | temperatures |
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States | geological survey | no. 54 | [Seal of the depar
rior] |
Washington | government printing office | 1889

Special title: United States geological survey |
rector | On the | thermo-electric measurement | of
tures | by | Carl Barus | [Survey design] |
Washington | government printing office | 1889

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verso blank; special title as above, verso blank; contents, pp. 5
9-10; list of tables, pp. 11-13, verso blank; letter of transmitta
chief chemist, p. 15, verso blank; preface, pp. 17-22; introducti
pp. 56-306 (710-960 of the volume); index, pp. 307-313, verso
VIII, verso blank; contents for vol. VIII, p. iii, verso blank; illus
pp. v-vii; notice as to numbering and binding, outside of back
1-55, 10a, 11a, 14a, 35a, 36a, 47a, and a frontispiece unnumbered

CONTENTS OF BULLETIN 54.

Letter of transmittal ....
Preface ....
Introduction...
  General account of methods of pyrometry..............................
    Earlier digests..
    Character of the measurements......................................
    Classification of pyrometers.......................................
    Dilatation of solids ....
    Dilatation of liquids ....
    Dilatation of gases (manometric methods) ....
    Dilatation of gases (displacement methods).........................
    Vapor tension..
    Dissociation ....
    Fusion...
    Specific heat..
    Ebullition ....
    Heat conduction..
    Radiation..

continued.

count of methods of pyrometry—continued.

Page.

ity 46
tics 47
o-electrics 48
ical conductivity 50
tism 52
olation methods 52
s of thermo-electric pyrometry 52
he degree of constant high temperature attained in metallic vapor baths of large
nsions; by C. Barus and W. Hallock 56
n 56
.... 57
ks 57
oiling points 58
g points between 100° and 300° 59
atus for mercury 61
g point of zinc 62
ital results 67
ds of measurement 67
thermo-couples 68
or mercury vapor baths 69
or zinc vapor baths 70
relative to low percentage alloys 77
tion of data 77
of alloys 79
The calibration of electrical pyrometers by the aid of fixed thermal data 84
on 84
for low boiling points (100° to 500°) 84
al forms of boiling tubes 84
ted forms of boiling tubes 86
g-point tubes for pressure work 88
bbs's ring burner 90
for high boiling points 90
al forms of boiling-point crucible 90
ted forms of boiling-point crucible 91
.... 95
measurement 97
o-element 97
rds of electromotive force 99
computation 103
ntal results 104
ration for constancy of temperature; water, aniline 104
ration for constancy of temperature, mercury 105
ration for constancy of temperature, sulphur 107
ration for constancy of temperature, zinc 108
calibration 110
igation of data 110
sion of data 114
variation of thermo-electric data 116
ion of continued ebullition, constant high temperature 116
ion of continued ebullition, constant low temperature 116
able substances for boiling points 119
of volatilization 121
liary data: antimony; bismuth; cadmium 122
no-electric datum for the melting point of platinum 124
Certain pyro-electric properties of the alloys of platinum 126
on 126
d mechanical treatment of the alloys 128
n and rolling 128
inary data, density 128
ninary data, electrical resistance of rods 131
ntal data 133
er mechanical treatment; resistance of wires 133
no-electrics of wires 135
erature coefficient 139

Chapter III.—Certain pyro-electric properties of the alloys of platinum—continu
  Experimental data—continued.
    General digest
  Discussion and inferences
    Earlier results
    Resistance and density
    Resistance and thermo-electrics
    Electrical tests for purity
    Electrical resistance and temperature coefficient
    Other relevant results
    General remarks
Chapter IV.—The calibration of electrical pyrometers by direct comparison wit
mometer
  Displacement methods of thermometry
  Constant volume thermometers
    Manometer
    Metallic capillary tubes
    Porcelain air-thermometer bulbs
    Machine for soldering porcelain
    Revolving muffle
    Remarks regarding apparatus and manipulation
  Constant volume air thermometer—method of computation
    The general equation
    The equation simplified
    Errors of the approximations
    Compensator
    Errors of measurement in general
  Constant volume air thermometer—experimental results
    Earlier results
    Later results
    Digression
  Constant pressure air thermometry—apparatus
  Constant pressure air thermometry—method of computation
    The general equation
    The equation simplified
    Volumetry of bulbs
    Errors of the approximations
    Compensator
  Constant pressure air thermometer—experimental results
    Manipulation
    Experimental data
    Graphic digests
  Constant pressure air thermometer—discussion
    Errors of measurement, in general
    Accuracy of the measurments made, group I
    Accuracy of the measurements made, group II
    Boiling point of zinc
    Coefficient of heat expansion of porcelain
    Remarks
Chapter V.—The pyrometric use of the principle of viscosity
  Introduction
    Remarks
    Literature
  Transpiration subject to the Poiseuille-Meyer law
  Apparatus
    General disposition of parts
    Apparatus for constant pressure
    The capillary apparatus
    Differential apparatus
    Method of heating
  Methods of computation
    The general equation
    Case of two cold ends, absolute apparatus
    Case of two cold ends, differential apparatus
  Experimental results
    Manipulation

.—The pyrometric use of the principle of viscosity—continued.

imental results—continued. Page.

omenclature 256
ta.... 258
sion.... 271
scosity at zero 271
scosity at high temperatures, kinetic inferences.... 273
  Sources of error.... 274
  Diffusion 275
  Sliding coefficient.... 276
  Advantages of an exponential law 277
  Effect of imperfect gaseity.... 279
w method of pyrometry.... 281
ethods of computation.... 281
sults 282
piration not subject to the Poiseuille-Meyer law 284
jects of the investigation.... 284
ffman's researches.... 285
imental results.... 287
anspiration under variable pressure.... 287
anspiration under constant pressure.... 288
anspirations compared differentially 293
sion.... 295
pparent viscosity and pressure.... 295
pparent viscosity and temperature 297
liquity of the linear loci.... 297
pplementary results 298
neral remarks.... 300
w method of pyrometry 302
actical remarks 302
ppur:enances 302
e transpiration pyrometer.... 302

opies published, the number required by the law relating to these bulletins.
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ins 47–54 form vol. VIII, as follows:

rtment of the interior | Bulletins | of the | United States | geo-
survey | Vol. VIII | [Seal of the department of the interior] |
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terior] |
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Special itle: United States geological survey |
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worth Clarke, chief chemist | [Survey design] |
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illustrations, p. 7, verso blank; letter of transmittal, p. 9, verso
"Scientific papers," p. 11, verso blank; text, pp. 13–75, verso blank
cellaneous analyses," p. 77, verso blank; the analyses, pp. 79–93, ve
pp. 95–96. 8°. Plate I; figs. 1–16.

This bulletin and subsequent ones have no volume pagination, t
them into volumes having been discontinued.

CONTENTS OF BULLETIN 55.

SCIENTIFIC PAPERS.

Studies in the mica groups. F. W. Clarke. (See bulletin 64) ....
The analysis and composition of tourmaline. By R. B. Riggs ....
Notes on certain rare copper minerals from Utah. By W. F. Hillebrand and H.
Mineralogical notes. By W. F. Hillebrand....................
Analyses of some natural borates and borosilicates. By J. Edward Whitfield...
On the Johnson county, Ark., and Allen county, Ky., meteorites. By J. Edwar
Scorodite from the Yellowstone park. By J. Edward Whitfield....................
Flow of solids, or behavior of solids under high pressure. By William Hallock.

MISCELLANEOUS ANALYSES.

Feldspar from the Hoosac tunnel ....
Two feldspars from Greylock mountain, Massachusetts....................
Three feldspars from Delaware....................
Triassic sandstone from Maryland ....
Limestone from the Auglaize river, Ohio ....
Twelve rocks from the Menomonee river ....
Rocks from Pigeon point, Minnesota ....
Two rocks from Montana....................
Fifteen rocks from California....................
Ores of iron and manganese....................
Coals ....
Iron and steel ....
Nitre from Utah....................
Salt from Warsaw, N. Y....................
Two clays from Owen's lake, California....................
Clay, sand, etc., from Martha's vineyard ....
Water from Paris, Me....................
Waters from Savannah, Ga....................
Artesian wells in Georgia and Alabama....................

Page.
kansas............ 92
pring near fort Wingate, N. Mex 92
en's lake, California............ 93

s published, the number required by the law relating to these bulletins.
s.

BULLETIN 56.

e: Department of the interior | Bulletin | of the | United
ological survey | no. 56 | Fossil wood and lignite of the
ormation |
ton | government printing office | 1889

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ological survey | no. 56 | [Seal of the department of the in-

on | government printing office | 1889

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ndividual plates (on rectos) and explanations of the same (on versos),
paged 55–68, each plate facing its explanation; index, pp. 69–72.
VII.

CONTENTS OF BULLETIN 56.

Page.
.... 11
tudy of internal structure, with brief review of its progress............ 11
graphic distribution of the Potomac formation............ 38
ins and their mode of occurrence............ 39
ption of lignite............ 41
ption of silicified species............ 43
lon Göppert............ 43
lon pulchellum, n. sp............ 45
lon McGeei, n. sp............ 46
lon Wardi, n. sp............ 48
lon Columbianum, n. sp............ 49
on Kraus............ 50
on Virginianum, n. sp............ 50

published, the number required by the law relating to these bulletins.

BULLETIN 57.

: Department of the interior | Bulletin | of the | United
ogical survey | no. 57 | A geological reconnaissance in
n | Kansas |
on | government printing office | 1890

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Robert Hay | [Survey design] |
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tions, p. 7, verso blank; letter of transmittal, p. 9, verso blank; in
J McGee, pp. 11–14; text, pp. 15–48; index, p. 49. 8°. Plates I an

CONTENTS OF BULLETIN 57.

Introduction by W J McGee
General statement
The geologic formations
  Carboniferous
  Jura-Trias
  Cretaceous
    The Dakota
    The fort Benton
    The Niobrara
    The post-Cretaceous erosion
  Tertiary
    The Tertiary grit
    The Tertiary marl
    The Tertiary erosion
  Quaternary
    The gumbo
    The earlier gravel
    The loess
    The later gravel
    The alluvium
Conclusion
  The general results
    The source of the Tertiary conglomerates
    The question of Tertiary shores
    The tripartite erosion
  Economic geology

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the interior] |
Washington | government printing office | 1890

Special title: United States geological survey | J.
rector | The | glacial boundary | in | western Pennsylva
tucky, | Indiana, and Illinois | by | George Frederick
an introduction by Thomas Chrowder Chamberlin | [Su
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er cover bearing title as above; sample library catalogue slips, verso blank, dvertisement of the publications of the survey, pp. i–v; general title as verso blank; special title as above, verso blank; contents, pp. 5–7, verso illustrations, p. 9, verso blank; letter of transmittal by T. C. Chamberlin, ist in charge, p. 11, verso blank; introduction by T. C. Chamberlin, pp. 13–38; p. 39–110; index, pp. 111–112. 8°. Plates I–VIII; figs. 1–10.

CONTENTS OF BULLETIN 58.

Page.
UCTION BY T. C. CHAMBERLIN 13
s of the upper Ohio river district 22
high horizontal terraces 23
higher river terraces 24
lower river or morain-headed terraces 32
General remarks on the two systems 33
slender horizontal terraces 37
structural terraces 38
ion 38
ACIAL BOUNDARY IN WESTERN PENNSYLVANIA, OHIO, KENTUCKY, INDIANA, AND ILLINOIS, F. WRIGHT 39
ction 39
surfaces of rocks in place 39
y of facts concerning the unstratified deposit called "till" 42
iminary remarks 42
eral distribution of till and its relations to buried channels 43
racter of the material composing the till 45
rce of bowlders in the till 50
rity of distribution of till near the margin 52
tribution of the till east of the Alleghanies 52
New England 52
New Jersey 55
Pennsylvania 55
New York 56
tribution of the till west of the Alleghanies 57
General remarks 57
Pennsylvania 58
Ohio 59
Kentucky 63
Indiana 65
Illinois 70
Missouri 72
eral remarks 73
esis of a glacial dam at Cincinnati 76
oduction 76
lower terraces of the Ohio and its tributaries 76
upper terraces of the Ohio and its tributaries 80
oretical explanations 82
The upper terraces the remnants of a distinct glacial epoch earlier than that producing the lower 82
Facts adverse to this theory 83
    Terraces on the Monongahela 83
    River deposits in Teazes valley, W. Va 86
    Terraces on the Big Sandy 88
    Terraces on the Elk river 88
    Terraces in Bath county, Ky 90
    Beach flats, Pike county, Ohio 92
    Freshness of the vegetable remains near the glacial margin 96
nmary 100
es and its relation to the glacial drift 101
ear the glacial margin 104
acial man in Ohio 105
l conclusions 108

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BULLETIN 59.

Cover title: Department of the interior | Bulletin | o
States | geological survey | no. 59 | The gabbros and as
in Delaware |
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States | geological survey | no. 59 | [Seal of the depar
interior] |
Washington | government printing office | 1890

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rector | The gabbros | and | associated rocks in Delawar
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above, verso blank; special title as above, verso blank; contents a
p. 5, verso blank; text, pp. 7–43, verso blank; index, p. 45. 8°. P

CONTENTS OF BULLETIN 59.

Introduction
General petrographical considerations
Hypersthene-gabbro
Gabbro-diorite
  Series illustrating transformations
Gabbro-granite
  Series illustrating transformations
Norite
The iron hill gabbros and gabbro-diorites
Diorite
  Series illustrating transformations
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  The gabbro belt
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BULLETIN 60.

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| Report of work done | in the | division of chemistry

ng the | fiscal year 1887–'88 | F. W. Clarke, chief chemist |
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CONTENTS OF BULLETIN 60.

Page.
11
cture of the natural silicates. By F. W. Clarke 13
rom Oregon. By F. W. Clarke 21
occurrence and utilization. By Thomas Marean Chatard 27
28
lphate 29
loride 30
rbonate 31
carbonate 34
squicarbonate 35
mode of occurrence 36
36
38
39
40
erica 41
ing 42
vn lakes, Nevada 46
vn soda works 49
ake, California 53
lake, Oregon 53
posits 55
lake, California 57
lake soda works 58
n the evaporation and fractional crystallization of the water of Owen's lake. 59
ation 59
nal crystallization 61
sion of results 65
nal crystallization of water of Mono lake 65
67
urao from Venezuela 67
urao from Egypt 68
aracter of Trona, or the native sesquicarbonate 69
al production of sesquicarbonate 72
om Owen's lake 75
al production of urao; experiments and discussion of results 78
hods 85
al soda 89
l color of alkaline brines 95
aline soils and clays 96
99
meteorites. By J. E. Whitfield 103
ckwood meteorite 103
ga county meteorite 106
county meteorite 106
le mountain meteorite 107
county meteorite 107
nardino county meteorite 114
tes from Colorado. By L. G. Eakins 115
ility for aqueous chlorhydric acid. By Robert B. Warder 119
ethod 120
esults 121
sults 122

Analyses of jade. By F. W. Clarke..

Mineralogical notes:

1. Petalite from Peru, Me. By F. W. Clarke........................
2. Spessartite from Amelia county, Va. By F. W. Clarke.............
3. Oligoclase from Bakersville, N. C. By F. W. Clarke.................
4. Willemite from Franklin, N. J. By F. W. Clarke.......................
5. Descloizite from Beaverhead county, Mont. By W. F. Hillebrand....
6. Preliminary remarks on North American uraninites. By W. F. Hille
7. Dumortierite from New York and Arizona. By J. E. Whitfield.......
8. Xanthitane from North Carolina. By L. G. Eakins......................
9. Triplite from the Black hills. By L. G. Eakins.........................
10. Kaolin from Gunnison county, Colo. By L. G. Eakins..................
11. Native gold from Persia. By C. Catlett..................................
12. Pyroxene and serpentine from Montville, N. J. By C. Catlett........

The subsidence of fine solid particles in liquids. Second paper (see bulletin 36

A new method of making alloys. By William Hallock..........................

Miscellaneous analyses:

Rocks collected by R. D. Irving..
Novaculite from Marquette, Mich...
Brick clay from New Ulm, Minn...
Rocks from Montana..
Eruptive rock from the Henry mountains, Utah...............................
Rocks from New Mexico...
Lavas from near Lassen peak, California.......................................
Basalt from Mytilene...
Inclusion in diorite from Cruger's station, N. Y...............................
White earth from Talladega, Ala...
Sandstone from Berea, Ohio..
Knox dolomite and residual clay, from Alabama..............................
Dolomite from Tuckahoe, N. Y...
Dolomite marble from Cockeysville, Md...
Marble from Louisiana..
Limestones from Ohio and Indiana...
Coquina, coral, coral rocks, etc..
Iron and manganese ores..
Coal and coke..
Efflorescence from Cliff creek, Colo..
Salt from Hutchinson, Kans...
Water from Lincoln county, N. C...
Water from St. Augustine, Fla..
Water from McLeansborough, Ill...
Water from Lebanon, Mo..
Water from Hominy hill, Ark..
Water from near Denver, Colo..
Water from Matilija hot springs, California.....................................

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o blank; half-title "Plates," p. 33, verso blank; half-titles of indi-
n rectos) and explanations of the same (on versos), three leaves, paged
e facing its explanation. 8°. Plates I-III.

CONTENTS OF BULLETIN 61.

Page.
rom New Idria, Fresno county, California 11
rom Sulphur bank, Lake county, California.................................. 21
rom Knoxville, Napa county, California 22
rom New Almaden, Santa Clara county, California 22
m Knoxville, Napa county, California.................................. 22
m Cerro Gordo mine, near Panoche, Fresno co., Cal.................................. 23
Redington quicksilver mine, Knoxville, Napa co., Cal.................................. 23
ngton mine, Knoxville, California.................................. 25
hur bank, Lake county, California.................................. 25
alico, San Bernardino county, California.................................. 27
te—Kotschubeite 27
.... 30
.... 30
.... 31
.... 33

blished, the number required by the law relating to these bulletins.

(ending with bulletin 54) the volume feature was discontinued by
of the subsequent bulletins the documentary edition required by
out by throwing together bodily as many as might be convenient.
rm a volume with the following title:

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tins | of the | United States | geological survey | nos. 55

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7–8; letter of transmittal, by R. D. Irving, geologist in charge,
explanatory and historical note, by Roland Duer Irving, pp. 11–3
verso blank; half-title "Plates," p. 219, verso blank; half-titles c
VIII–XVI (on rectos) and explanations of the same (on versos),
221–238, each plate facing its explanation and covered with tissue
239–241. 8°. Plates I–XVI; figs. 1–29.

CONTENTS OF BULLETIN 62.

Letter of transmittal, by R. D. Irving.........................
Explanatory and historical note, by R. D. Irving...................
Introduction...
Chapter I. Present state of our knowledge regarding the metamorphism of eru
  Value of the microscope in the study of metamorphism..................
  Historical outline of studies on the metamorphism of eruptive rocks.......
Chapter II. Greenstone belts of the Menominee iron district................
  Introductory and historical...............................
  Sturgeon falls...
  Lower, or Little Quinnesec falls ....
Chapter III. Greenstone belts of the Menominee iron district (continued) .....
  Upper, or Big Quinnesec falls ....
    The dark colored greenstones of the basin.....................
    The light colored greenstones at Upper Quinnesec falls ....
    The coarse grained diorites of the Horse race ....
    The acid rocks of the Upper Quinnesec falls and Horse race ....
  Four-foot falls...
  The Twin falls ....
    Lower Twin falls.....................................
    Upper Twin falls.....................................
Chapter IV. Greenstone belts of the Marquette district..................
  Introductory ....
  Rocks of the northern portion of the Marquette area ....
    Basic intrusives ....
    Acid intrusives.......................................
    Banded greenstone schists..............................
Chapter V. Greenstone belts of the Marquette district (continued) ....
  Rocks of the southern portion of the Marquette area....................
    The aphanitic greenstones ....
    Coarse grained dike rocks ....
    Greenstones south of the quartzite...........................
  Rocks of the Negaunee area.................................
    Aphanitic greenstones...................................
    Coarsely crystalline greenstones..........................
    The stretched fragmental rocks on the Carp river ....
    Acid rocks...
  Rocks of the northern area ....
    Unaltered basic intrusives...............................
    Altered coarse grained rocks ....
    Banded greenstones ....
  Green schists and agglomerates of Deer lake.......................
Chapter VI. General results and conclusions........................
  Original character of the Menominee and Marquette greenstone areas ....
    Evidence of eruptive character..............................

r VI.—General results and conclusions—continued.
ginal character of the Menominee and Marquette greenstone areas—continued. Page.
Different original rock types 197
Original mineral constituents 199
Conditions under which the greenstones were formed 200
crostructural metamorphism of the Menominee and Marquette massive rocks 201
Macrostructural metamorphism through compression, faulting, or crushing 202
Macrostructural metamorphism through stretching 204
crostructural metamorphism of the Menominee and Marquette massive rocks 204
Effects of dynamic action on individual minerals 205
New structures produced by dynamic action 206
neralogical (chemical) metamorphism of the Menominee and Marquette massive rocks 208
Secondary minerals and their origin 209
Progress of alteration in the original minerals 214

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30 cents.

BULLETIN 63.

ver title: Department of the interior | Bulletin | of the | United
s | geological survey | no. 63 | A bibliography of Paleozoic Crus-
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I, list of authors," p. 11, verso blank; text, pp. 13–78; half-title "Part II, cat-
of trilobites," p. 79, verso blank; text, pp. 81–148; half-title "Part III, cata-
of non-trilobites," p. 149, verso blank; text, pp. 151–177. 8°.

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preface, p. 7, verso blank; text, pp. 9–60. 8°.

CONTENTS OF BULLETIN 64.

A theory of the mica group, by F. W. Clarke. (See bulletin 55)..................
A platiniferous nickel ore from Canada, by F. W. Clarke and Charles Catlett....
A new occurrence of gyrolite, by F. W. Clarke..................................
Analyses of three descloizites from new localities, by W. F. Hillebrand..........
A new meteorite from Mexico, by J. Edward Whitfield..........................
Dumortierite from Harlem, N. Y., and Clip, Ariz., by J. S. Diller and J. E. Whitfie
Chemical action between solids, by William Hallock.............................
The flow of solids: a note, by William Hallock...................................
Miscellaneous analyses (by Hillebrand, Eakins, Whitfield, Chatard, Catlett, Cl
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title as above, verso blank; special title as above, verso blank; co
illustrations, pp. 11–14; letter of transmittal, p. 15, verso blank;
verso blank; index, pp. 207–212. 8°. Plates I–XI; figs. 1–152, pla
showing the general distribution of the Carboniferous in Pennsyl
ginia, and Ohio.

CONTENTS OF BULLETIN 65.

Area, structure, and classification of the bituminous coal rocks..................
The Permo-Carboniferous or Dunkard creek measures...........................
The upper coal measures, or Monongahela river series..........................
The barren measures, or Elk river series......................................
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BULLETIN 66.

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| mountains, New Mexico, and on the | occurrence of pri-
: | in certain basalts. |
on | government printing office | 1890
tle: Department of the interior | Bulletin | of the | United
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on | government printing office | 1890
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group of volcanic rocks | from the | Tewan mountains, New
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oseph Paxson Iddings | [Survey design] |
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ent of the publications of the survey, pp. i–iv; general title as above,
ecial title as above, verso blank; contents, p. 5, verso blank; letter
by Arnold Hague, p. 7, verso blank; text, pp. 9–32; index, pp.

CONTENTS OF BULLETIN 66.

Page.
.... 9
cription.. 10
.... 10
phyritic varieties.. 10
.... 11
.... 11
g rhyolite.. 11
.... 12
.... 12
.... 12
racteristics.. 12
Mica-andesite.. 13
. Hornblende-mica-andesite.. 13
I. Hornblende-pyroxene-andesite.. 14
. Pyroxene-andesite.. 15
.... 16
lts.. 16
ng basalt.. 16
tions.. 17

The occurrence of primary quartz grains in basalts
  Basalt from rio Grande cañon
  Basalt from Arizona
  Basalt from Colorado
  Possible origin of porphyritical quartz
    Its exceptional occurrence
    Variation of conditions
    Influence of absorbed water
    Comparison of exceptional occurrences
    Changes of physical conditions
    Influence of water vapor
    Application to quartz-bearing basalts
  Confirmatory observations
    Porphyritical quartz in other volcanic rocks
    Chemical similarity of basalts with and without quartz
    Chemical differences between basalts with quartz
    Different mineral development of chemically similar magmas
Summary

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rector | The relations | of the | traps of the Newa
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pp. 5–6; illustrations, pp. 7–9, verso blank; letter of transmittal,
geologist in charge, p. 11, verso blank; text, pp. 13–74; bibliog
verso blank; index, pp. 81–82. 8°. Plates I–VI; figs. 1–49.

CONTENTS OF BULLETIN 67.

Introduction
Watchung trap sheets
  Structural relations in the Watchung region
  Mutual relations of the Watchung traps
  First and second Watchung traps
    General relations
    Thickness—Faults
    Columnar structure
    Succession of sheets
    The surface of the trap sheets and their contact relations with the inclos

heets—continued. Page.
ung trap 32
relations 32
s 33
ucture 34
to the associated sedimentary rocks 34
o 34
n trap 36
37
ions 37
lations in the Palisade region 39
41
44
nderlying strata 45
verlying strata 50
53
54
55
56
Ten mile run mountain, Rocky hill, Pennington mountain, Bald pate, and
ps 59
ins trap 61
k and Round mountains 62
in the Raritan river region 65
ses of the Delaware river region 68
69
70
74

ublished, the number required by the law relating to these bulletins.

BULLETIN 68.

: Department of the interior | Bulletin | of the | United
ogical survey | no. 68 | Earthquakes in California in 1889 |
on | government printing office | 1890

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Survey design] |
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verso blank; special title as above, verso blank; contents, p. 5, verso
p. 7-24; index, p. 25. 8°. See bulletin 95.

CONTENTS OF BULLETIN 68.

Page.
7
ents 7
nsity 8
d 10

ublished, the number required by the law relating to these bulletins.

BULLETIN 69.

Cover title: Department of the interior | Bulletin
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title as above, verso blank; special title as above, verso blank;
blank; preface, pp. 7-8; the bibliography, pp. 9-98; index of aut

CONTENTS OF BULLETIN 69.

Preface
General for all geological times, or without regard to times, or miscellaneous
General for Paleozoic time
Special for Paleozoic time
- Myriapoda
- Arachnida
- Neuropteroidea
- Orthopteroidea
- Hemipteroidea
- Coleopteroidea

General for Mesozoic time
Special for Mesozoic time
- Myriapoda
- Arachnida
- Neuroptera
- Orthoptera
- Hemiptera
- Coleoptera
- Diptera
- Lepidoptera
- Hymenoptera

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sement of the publications of the survey, pp. i–v, verso blank; general
ove, verso blank; special title as above, verso blank; contents, p. 5, verso
stration p. 7, verso blank; letter of transmittal, p. 9, verso blank; text,
8°. 1 figure.

CONTENTS OF BULLETIN 70.

Page.
l positions determined in 1889 and 1890 11
ion of stations.......... 12
rville, Kansas; Boisé city, Idaho; Cisco, Texas; Sierra Blanca, Texas.......... 12
ents and instrumental constants 12
ruments used at St. Louis and in field, and their constants 12
s.......... 13
ods of observation and computation; tables of results 13
les 23
ods of observation and computation; tables of results.......... 23
onal equation work 24
-piece corrections and rates 62
rd of clock comparisons and apparent differences of longitude 64
itude differences uncorrected for personal and instrumental equation.......... 66
ections for personal and instrumental equation, 1889.......... 67
ections for personal and instrumental equation, 1890.......... 69
ngement of telegraphic circuits, transmission times, etc.......... 70
ted longitudes 70
raphical positions of piers.......... 71
of the one hundred and fifth meridian in El Paso county, Texas.......... 71
od adopted to fix meridian.......... 71
urement of base-line.......... 72
es of triangulation 74
ection with base of Texas geological survey.......... 77
uth of base-line 78
etic position of points in triangulation.......... 78
ions of stones marking the one hundred and fifth meridian 79
able error of position of meridian as defined by marking stones.......... 80

ies published, the number required by the law relating to these bulletins.
ents.

entary edition of bulletins 66–70 in a single volume was issued as follows:

ngress, | 1st session. | House of representatives. | Mis. doc. |
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of the world, | including myriapods and arachnids |
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States | geological survey | no. 71 | [Seal of the de
interior] |
Washington | government printing office | 1891

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rector | Index | to the known | fossil insects of t
ding | myriapods and arachnids | by | Samuel Hub
[Survey design] |
Washington | government printing office | 1891

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1 l.; advertisement of the publications of the survey, pp. i–v, v
title as above, verso blank; special title as above, verso blank;
blank; letter of transmittal to the director, pp. 7–8; text, pp. 9
eric names, pp. 735–744. 8°. See bulletin no. 31.

CONTENTS OF BULLETIN 71.

Paleozoic fossils
  Myriapoda
  Arachnida
  Palæodictyoptera
    The orthopteroid series
    The neuropteroid series
    The hemipteroid series
    The coleopteroid series
    Others
Mesozoic fossils
  Myriapoda
  Arachnida
  Hexapoda
    Orthoptera
    Neuroptera
    Hemiptera
    Coleoptera
    Diptera
    Lepidoptera
    Hymenoptera
  Tracks and foot-prints
Cenozoic fossils
  Myriapoda
  Arachnida
  Hexapoda
    Orthoptera
    Neuroptera
    Hemiptera

continued.
ntinued.

	Page.
a	450
	595
ra	671
tera	682
	735

published, the number required by the law relating to these bulletins.

ry edition of bulletin 71 alone was published, as follows:

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rvey | no. 71 |
on | government printing office | 1892

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the fifty-second congress."

BULLETIN 72.

Department of the interior | Bulletin | of the | United
gical survey | no. 72 | Altitudes between lake Superior
cky mountains |
on | government printing office | 1891

le: Department of the interior | Bulletin | of the | United
gical survey | no. 72 | [Seal of the department of the

n | government printing office | 1891

e: United States geological survey | J. W. Powell, di-
udes | between | lake Superior and the Rocky moun-
Varren Upham | [Survey design] |
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verso blank; special title as above, verso blank; contents, pp. 5–10;
ittal to the director by T. C. Chamberlin, geologist in charge, p. 11,
troduction, pp. 13–17; text, pp. 18–193, verso blank; indexes (of hills
lakes, and towns and stations), pp. 195–229. 8°.

CONTENTS OF BULLETIN 72.

	Page.
	13
e Superior, November, 1870, to January, 1888	18
ads	19
ic railroad system	19
ic railroad system	39
Hudson bay railway	52
orthwestern railway	52
and navigation company's railway	57
g lake railway	57
luth railway	57
n range railroad	62

Altitudes of railroads—continued.
  Wisconsin central railroad (the part in Minnesota)........................
  Chicago, Burlington and northern railroad (the part in Minnesota) ......
  Minneapolis, Sault Ste. Marie and Atlantic railway........................
  Minneapolis and Pacific railway..
  Great northern (formerly St. Paul, Minneapolis and Manitoba) railway s
  Chicago, Milwaukee and St. Paul railway system ....
  Chicago and northwestern railway ....
  Chicago, St. Paul, Minneapolis and Omaha railway........................
  Chicago, St. Paul and Kansas city railway ....
  Minneapolis and St. Louis railway ....
  Burlington, Cedar rapids and northern railway.............................
  Fremont, Elkhorn and Missouri valley railroad.........................
Altitudes of rivers ....
  St. Lawrence river system ....
  Mississippi river system ....
  Minnesota river system ....
  Missouri river system ....
  Streams and lakes on the canoe route from lake Superior to the Lake of
    of the Kaministiquia, Dog, Sturgeon, and Rainy rivers ....
  System of the Rainy and Winnipeg rivers.................................
  System of the Red river of the north ....
  Saskatchewan river...
  Nelson river...
Altitudes of watersheds, hills, mountains, lakes, and streams, on routes of
    surveys..
  Additional notes from railroad surveys in Minnesota.......................
  Chains of lakes in Martin county..
  St. Paul and vicinity ....
  Minneapolis and vicinity...
  Northeastern Minnesota..
  Various topographic districts in Minnesota ....
  Morainic belts in Iowa ....
  Plateaus, hills, and lakes in South and North Dakota ....
  On the international boundary ....
  Manitoba and adjoining parts of British America ....
Index of hills and mountains..
Index of lakes..
Index of towns and stations ....

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BULLETIN 73.

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title as above, verso blank; special title as above, verso blank;

lustrations, pp. ix–x; preface, pp. xi–xii; text, pp. 1–135, verso
p. 137–139. 8°. Plates I–VI; figs. 1–28. Chapter I (pp. 1–52) is
and Vincent Strouhal."

CONTENTS OF BULLETIN 73.

Page.
.... xi
cosity of steel and its relations to temper, by C. Barus and V. Strouhal 1
.... 1
es 2
arch 2
riment 3
.... 3
pparatus 3
apparatus 5
apparatus 6
oserving 6
empering 6
ng 6
ng 8
of errors 9
ta 12
.... 12
explanations 12
proper 14
.... 14
nealed at 25° and 100° 14
nealed at 190° 18
ealed at 360° 21
ealed at 450° 23
.... 25
the tables 28
s experiments 29
ers 29
and drawn 31
nd copper 35
nealed at 450° and 1000° 37
ar arrangement 37
apparatus 38
.... 39
ation of $(\phi-\phi')$ 39
l temper 41
ligest 41
e results 42
and electrics of steel 44
and hardness 44
phenomenon 45
s of the bifilar wires 45
l strain 47
glass 47
iron 47
quenching 48
cast-iron 49
ensity estimated 49
tions 50
and magnetic intensity 50
and viscous maxima in steel 50
iron 51
.... 51
cosity of steel and its relations to temperature 53
.... 53
rement 53
s 53
apparatus 55
n 57

- Chapter II.—The viscosity of steel and its relations to temperature—continue
  - Experimental results
    - Residual twist
  - Torsional viscosity and temperature
    - Notation
    - Viscosity at 100°
    - Viscosity at 190°
    - Viscosity at 360°
    - Remarks on the tables
  - Deductions
    - Viscosity and temperature
    - Behavior of other metals
    - Viscosity and pressure
    - Sudden and gradual deformation
- Chapter III. Maxwell's theory of the viscosity of solids and its physical verit
  - Introduction
  - Historical sketch of the theories of solid viscosity
    - O. E. Meyer's theory
    - Boltzmann's theory
    - Neesen's theory
    - Warburg's theory
    - Nissen's theory
    - Maxwell's theory
  - Experimental results
    - Apparatus
      - Theory of the apparatus
      - Measurements with steel
      - Viscous behavior of the rods
      - Mean values deduced
      - Data of the measurements with platinum alloys
  - Deductions from platinum alloys
    - Viscous effect of alloying
    - Effect of annealing and hardening platinum
    - Summary
  - Deductions for steel
    - "Accommodation" in glass-hard steel
      - The phenomena proper
      - Motional effects estimated
      - "Accommodation" and hysteresis
      - Viscous and electrical behavior compared
      - Viscosity at mean atmospheric temperature
      - Viscosity at 100°
      - Viscosity at higher temperatures
      - Annealing and viscous deformations superposed
      - Viscosity and stress
      - The phenomenon of glass-hardness
      - The phenomena of annealing
      - The temper-strain in other substances
      - Extremes of complex and of simple molecular structure
      - Thermal stability of magnetic configuration
      - Intensity of magnetic configuration
  - Summary
    - Clausius's and Maxwell's theories compared
- Chapter IV. The effect of magnetization on the viscosity and on the rigidity c
  - Introduction
  - Viscosity of magnetized steel and iron
    - Apparatus and method
    - Results
  - Rigidity of magnetized iron
    - Definitions and results
    - Deductions
      - Constant fields
      - Intermittent fields
  - Rigidity of magnetized steel
- Chapter V. The change of the order of absolute viscosity encountered on pas solid

ange of the order of absolute viscosity, etc.—continued.

Page.
.... 120
rs 120
.... 121
.... 121
tus........ 121
ation. Example: glycerine 121
marine glue 123
for paraffine........ 124
.... 124
of comparison 124
ion of results 125
ncountered........ 125
remarks on solid viscosity 126
us for direct method 126
of computation........ 128
tained 128
.... 132
ective........ 132
eous breaking 132
riation of absolute viscosity........ 132
of the three states of aggregation 134

blished, the number required by the law relating to these bulletins.

BULLETIN 74.

Department of the interior | Bulletin | of the | United gical survey | no. 74 | The minerals of North Carolina | | government printing office | 1891

: Department of the interior | Bulletin | of the | United gical survey | no. 74 | [Seal of the department of the inte- | government printing office | 1891

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CONTENTS OF BULLETIN 74.

Page.
l 9
.... 11
.... 13
.... 13
.... 14
.... 14
.... 14
.... 14
ing meteorites........ 14
.... 20
.... 20
.... 21
.... 21
.... 22

- Sulphides, etc
  - Sulphides and tellurides of metals of the sulphur and arsenic groups
    - Stibnite
    - Bismuthinite
    - Tetradymite
    - Molybdenite
  - Sulphides, etc., of the iron, gold, and tin groups
    - Argentite
    - Galenite
    - Altaite
    - Bornite
    - Sphalerite or zinc blende
    - Chalcocite
    - Troilite
    - Pyrrhotite
    - Schreibersite
    - Pyrite
    - Chalcopyrite
    - Barnhardtite
    - Marcasite
    - Leucopyrite
    - Arsenopyrite
    - Nagyagite
    - Covellite
  - Sulpharsenides, sulphantimonides, etc
    - Proustite
    - Aikinite
    - Tetrahedrite
- Compounds of chlorine, etc
  - Halite
  - Cerargyrite
  - Ferrous chloride
- Fluorine compounds
  - Fluorite
  - Yttrocerite
- Oxygen compounds
  - Oxides
    - Cuprite
    - Melaconite
    - Corundum
    - Hematite
    - Menaccanite
    - Spinel
    - Gahnite
    - Magnetite
    - Chromite
    - Cassiterite
    - Uraninite
    - Rutile
    - Anatase
    - Brookite
    - Pyrolusite
    - Braunite
    - Hausmannite
    - Diaspore
    - Göthite
    - Limonite
    - Gummite
    - Psilomelane
    - Wad
    - Senarmontite or valentinite
    - Bismite
    - Molybdite
    - Quartz
    - Opal

-continued.

Page.
compounds—silicates 42
icates 42
.... 42
.... 43
.... 43
.... 44
.... 45
.... 45
.... 46
.... 46
.... 47
.... 48
.... 49
.... 49
.... 50
.... 50
.... 51
.... 52
.... 52
.... 52
.... 54
.... 55
.... 55
.... 56
.... 56
.... 57
.... 58
.... 58
.... 59
.... 59
.... 60
.... 60
es 60
.... 60
.... 61
.... 61
.... 62
.... 62
.... 62
.... 62
.... 63
.... 63
.... 63
.... 63
.... 64
.... 64
.... 64
.... 64
.... 64
.... 65
.... 65
.... 66
.... 66
.... 66
d chlorite 67
.... 68
.... 68
.... 69
.... 69
.... 70
.... 70
.... 70
.... 71
bates 71
microlite 71

Oxygen compounds—continued.
- Tantalates, columbates—continued.
  - Hatchettolite
  - Tantalite
  - Columbite
  - Yttrotantalite
  - Samarskite
  - Rutherfordite
  - Fergusonite
  - Polycrase
  - Rogersite
- Phosphates, arsenates, etc
  - Xenotime
  - Apatite
  - Pyromorphite
  - Monazite
  - Vivianite
  - Olivenite
  - Pseudomalachite
  - Lazulite
  - Scorodite
  - Wavellite
  - Pharmacosiderite
  - Dufrenite
  - Phosphuranylite
  - Autunite
  - Niter
- Tungstates, molybdates, etc
  - Wolframite
  - Rhombic tungstate of lime
  - Scheelite
  - Cuproscheelite
  - Stolzite
- Sulphates, chromates, etc
  - Barite
  - Anglesite
  - Crocoite
  - Melanterite
  - Goslarite
  - Chalcanthite
  - Alunogen
  - Misy
  - Montanite
- Carbonates
  - Calcite
  - Dolomite
  - Magnesite
  - Siderite
  - Rhodochrosite
  - Cerussite
  - Malachite
  - Azurite
  - Bismutite

Mineral coal
- Anthracite
- Bituminous coal
- Lignite

Organic compounds
- Amber

Synopsis of minerals and mineral localities by counties

Index

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Price, 15 cents.

BULLETIN 75.

Cover title: Department of the interior | Bulletin | of the | United
ates | geological survey | no. 75 | Record of North American ge-
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ates | geological survey | no. 76 | [Seal of the department of the in-
ior] |
Washington | government printing office | 1891

Special title: United States geological survey | J. W. Powell, di-
tor | A | dictionary of altitudes | in | the United States | (second
tion) | compiled by | Henry Gannett | chief topographer | [Survey
sign] |
Washington | government printing office | 1891

Paper cover bearing title as above; sample library catalogue sli
l.; advertisement of the publications of the survey, pp. i-v, vers
title as above, verso blank; special title as above, verso blank
mittal to the director, p. 5, verso blank; schedule of authorities,
viations of names of railroads, pp. 15-19, verso blank; the dictio
8°. Arranged alphabetically by railroad stations. See bulletin n

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States | geological survey | no. 77 | The Texan Permian
zoic types of fossils |
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States | geological survey | no. 77 | [Seal of the departm
terior] |
Washington | government printing office | 1891

Special title: United States geological survey | J.
rector | The Texan Permian | and its | Mesozoic types o
Charles A. White | [Survey design] |
Washington | government printing office | 1891

Paper cover bearing title as above; sample library catalogue sli
l.; advertisement of the publications of the survey, pp. i-v, vers
title as above, verso blank; special title as above, verso blank; co
trations, p. 5, verso blank; letter of transmittal to the director, p
synopsis of results, p. 8; text, pp. 9-39, verso blank; half-title
verso blank; descriptions of plates, pp. 44, 46, 48, and 50 (versos),
case containing the word "Plate" and its number as a half-title;
Plates I-IV; fig. 1.

CONTENTS OF BULLETIN 77.

Synopsis of results..
Introduction..
Description of species..
General discussion..

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BULLETIN 78.

Cover title: Department of the interior | Bulletin |
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of chemistry and | physics, mainly during the fiscal yea
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General title: Department of the interior | Bulletin |
States | geological survey | no. 78 | [Seal of the depart
terior] |
Washington | government printing office | 1891

title: United States geological survey | J. W. Powell, di-
Report of work done | in the | division of chemistry and
mainly during the | fiscal year 1889–'90 | Frank Wiggles-
arke, chief chemist | [Survey design] |
gton | government printing office | 1891

er bearing title as above; sample library catalogue slips, verso blank,
isement of the publications of the survey, pp. i–v, verso blank ; general
ve, verso blank; special title as above, verso blank; contents, pp. 5–6;
s, p. 7, verso blank; preface, p. 9, verso blank; text, pp. 11–129, verso
ex, p. 131. 8°. Figs. 1–9.

CONTENTS OF BULLETIN 78.

Page.
.... 9
pon the constitution of the natural silicates, by F. W. Clarke and E. A. Schneider. 11
.... 13
.... 13
.... 15
ite group 19
.... 24
culites 28
iderations 31
bundance of the chemical elements, by F. W. Clarke 35
nce of nitrogen in uraninite, and on the composition of uraninite in general; by illebrand 43
troductory remarks 43
n of samples for analysis 45
f analysis 46
and examination of nitrogen 53
of nitrogen 56
f uraninite 60
ian and Saxon uraninite 72
of analyses 73
periments relating to the nitrogen in uraninite 76
of heating in air 76
of heating in carbonic acid gas 77
of heating in hydrogen 77
s 78
e from New Almaden, California, by W. H. Melville 80
for the determination of water in mineral analysis, by Thomas M. Chatard 84
of titanium, chromium, aluminum, iron, barium and phosphoric acid in rock Thomas M. Chatard 87
eorites, by L. G. Eakins 91
orite from Texas 91
on from North Carolina 93
om Kansas 94
on from Texas 95
on from Chili 95
from Iowa 95
nca meteorite 97
from Cuba, by H. N. Stokes 98
.... 100
d fatty hydrocarbons 100
ydrocarbons 100
.... 101
nineral resin from Livingston, Montana, by H. N. Stokes 105
es on the coefficients of thermal expansion of certain rocks, by William Hallock. 109
.... 109
.... 115
nalyses 119
te 119
blende 119
.... 120

Miscellaneous analyses—continued.
- Liebenerite?
- Kaolin
- Picrallumogene
- Brochantite
- Keratophyr from Marblehead neck, Massachusetts
- Websterite from North Carolina and Maryland
- Feldspars from Minnesota gabbros
- Eruptive rock from Montana
- Rocks from California
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- Water from Webster grove, Missouri
- Brass

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ern California | and its peculiar lava |
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terior] |
Washington | government printing office | 1891

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tor | A late volcanic eruption | in | northern California |
liar lava | by | Joseph Silas Diller | [Survey design] |
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l.; advertisement of the publications of the survey, pp. i–iv, ve
title as above, verso blank; special title as above, verso blank; co
blank; illustrations, p. 7; synopsis of contents, p. 8; text, pp.
I–XVII; figs. 1–4.

CONTENTS OF BULLETIN 79.

Synopsis of contents
Introduction
General view of the scene
The cinder cone
The ash field
The lava field
Ancient lake bed
History of the eruption
Age of the eruption
The lava-quartz basalt
The quartz of the quartz basalt
Distribution of quartz basalt

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BULLETIN 80.

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title: United States geological survey | J. W. Powell, direc-
elation papers | Devonian and Carboniferous | by | Henry
lliams | [Survey design] |
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isement of the publications of the survey, pp. i-v, verso blank; general
e, verso blank; special title as above, verso blank; contents, p. 5, verso
r of transmittal to the director by G. K. Gilbert, geologist in charge,
tline of the paper, pp. 11-12; text, pp. 13-269, verso blank; index, pp.
.

CONTENTS OF BULLETIN 80.

Page.
mittal by Mr. G. K. Gilbert 7
paper 11
The state of opinion at the beginning of the present century regarding the classi-
naming of geologic formations 13
he history and development of opinion regarding the classification of rocks in
tates, from the time of William Maclure to the completion of the geological sur-
ate of New York (1809-1843) 22
The general application of the nomenclature of the New York system as a
correlation in other parts of the United States (1840-1851) 58
Miscellaneous discussions regarding the correlation of Devonian and Carbonifer-
ns in the central part of the United States (1846-1887) 75
The differentiation of the Carboniferous system 83
he Coal measures or Pennsylvanian series: The development of its nomenclature
tion in the Appalachian province (1836-1888) 108
The conglomerates and lower Carboniferous formations of the Appalachian
.... 121
The Chemung-Catskill problem: The history of the discussions concerning the
f the Chemung-Catskill formations in the northern part of the Appalachian
.... 135
The lower Carboniferous or Mississippian series: The development of the
e and classification of the lower Carboniferous formations of the Mississippian
21-1874) 173
The Waverly problem: The history of the discussion concerning the correlation
rly, Marshall, Goniatite limestone, Kinderhook, and Choteau formations (1838-
.... 193
he Permian problem: Discussions relative to the correlation of the Permian in
Nebraska and other parts of the United States (1858-1886) 213
Devonian and Carboniferous correlations in the western and northern provinces
erica 226
The Acadian province: The correlations and classifications of the upper Pale-
ions in the Acadian province 258

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ered by the department for free distribution. Price, 20 cents.

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interior] |
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| Correlation papers | Cambrian | by | Charles D
[Survey design] |
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1 l.; advertisement of the publications of the survey, pp. i-v
title as above, verso blank; special title as above, verso bla
verso blank; illustrations, p. 11, verso blank; letter of tran
by G. K. Gilbert, geologist in charge, p. 13, verso blank; ou
15-16; text, pp. 17-434; index, pp. 435-447. 8°. Plates I-III

CONTENTS OF BULLETIN 81.

Letter of transmittal
Outline of this paper
Chapter I. Introductory
  Literature
    List of authors and year of publication
    List of papers by dates
Chapter II. Historical review of the geologic and paleontologic work
  Atlantic coast province
    Newfoundland
    Nova Scotia
    New Brunswick and Cape Breton
    Maine
    New Hampshire
    Eastern Massachusetts
  Paleontology
    Newfoundland
    New Brunswick and Cape Breton
    Eastern Massachusetts
  Appalachian province
    Northern Appalachian district
      Granular quartz
      Red sandrock

istorical review of the geologic and paleontologic work—continued.
n provinces—continued.
n Appalachian district—continued.

Page.
rgia slates 98
dam sandstone 113
adian extension 114
n Appalachian district 122
Jersey 122
ware 123
nsylvania 124
yland 133
inia 133
h Carolina 138
nessee 139
gia 144
ama 146
gy 148
Appalachian district 148
Appalachian district 154
Jersey, etc 154
essee 154
gia 155
ain province 155
Nevada 155
.... 161
.... 162
extension 163
y 165
nental province 171
ssissippi area 171
onsin 171
esota 181
.... 187
Superior sandstone 188
uri 199
order or Adirondack sub-province 201
extension 207
order or Rocky mountain sub-province 209
do 209
ing 211
a 214
ern sub-province 216
.... 216
na 219
y 221
ssissippi area 221
ndstone of lake Superior 228
uri 229
rder or Adirondack sub-province 229
order or Rocky mountain sub-province 233
.... 234
a 235
nenclature employed in the description of the formations 236
.... 237
.... 242
.... 243
.... 243
.... 244
.... 245
.... 245
.... 245
.... 245
.... 246
.... 246
.... 246
.... 246

Chapter III.—Nomenclature employed in the description of the formations—continued. Page.

- Hickory 246
- Connasauga 246
- Montevallo 247
- Choccolocco 247
- Coosa 247
- Rome sandstone 247
- Bretonian 247
- Acadian 248
- St. John's 248
- Johannian 249
- Georgia 249
- Granular quartz 250
- Red sandrock 250
- Primal 251
- Chilhowee 251
- Weisner 251
- Ocoee 252
- Prospect 252
- Eastern and western sandstone 252
- Lake Superior sandstone 252
- Potsdamic 252

Chapter IV. Summary of the present knowledge of the formations 253

- Atlantic coast province 253
  - Newfoundland and the adjoining coast of Labrador 253
    - Northwestern Newfoundland 253
    - Southwestern Newfoundland 256
    - Eastern and southeastern Newfoundland 257
  - Nova Scotia 262
  - New Brunswick and Cape Breton 262
  - Maine 267
  - New Hampshire 267
  - Eastern Massachusetts 268
  - Résumé 273
- Appalachian province 274
  - Northern Appalachian district 275
    - Canadian extension 285
  - Southern Appalachian district 287
    - New Jersey 287
    - Delaware 288
    - Pennsylvania 288
    - Maryland 289
    - Virginia 290
    - North Carolina 299
    - Tennessee 299
      - Ocoee conglomerate 299
      - Chilhowee sandstone 300
      - Knox sandstone and shale 301
    - Georgia 303
    - Alabama 305
    - Résumé 308
- Rocky mountain province 313
  - Utah and Nevada 313
  - Idaho 320
  - Montana 323
  - Canadian extension 326
  - Résumé 328
- Interior continental province 330
  - Upper Mississippi valley 330
    - Canadian extension 334
  - Lake Superior sandstone 335
    - Canadian extension 339
  - Missouri 339
  - Eastern border or Adirondack sub-province and its Canadian extension 341
    - Section at Potsdam 342
    - Section at Chateaugay chasm 342

.—Summary of the present knowledge of the formations—continued.
continental province—continued.
tern border or Adirondack sub-province and its Canadian extension—continued. Page.

Section at Hemmingford 343
Section at Keeseville and in Au Sable chasm 343
Section at Whitehall 344
Section at Saratoga 346
stern border or Rocky mountain sub-province 347
South Dakota 347
Wyoming 349
Colorado 351
thwestern sub-province 354
Texas 354
Arizona 356
Résumé 357
is of the Cambrian group 359
e of Cambrian 362
nmit of Cambrian 362
imentation of the Cambrian group 363
division of the Cambrian 370
ison with the Cambrian rocks of other countries 373
ope 373
tland 376
land 377
na 377
ia 378
stralia 378
th America 379
Problems for investigation and settlement 380
roblems 380
wfoundland 380
va Scotia 380
w Brunswick 381
ine and New Hampshire 381
tern Massachusetts 381
w York 381
irondack sub-province 381
rmont 381
nadian extension 382
w Jersey 382
nsylvania 382
ginia 383
rth Carolina 383
nnessee 383
orgia and Alabama 383
h and Nevada 384
orado 384
cky mountains 384
izona 385
per Mississippi valley 385
ssouri 385
xas 385
ns affecting our knowledge of the Cambrian group as a whole or in large parts 385
ns of nomenclature and classification 388
e name 388
e limit of the group 388
I. The criteria and principles used by authors in the correlation of the various parts g the group, with observations on some methods of correlation 391
ical notes 391
nerica 391
Maclure 391
Eaton 392
Bigsby 395
James 396
Bakewell 397
De la Beche 398

Chapter VI.—The criteria and principles used by authors, etc.—contin
- Historical notes—continued.
  - America—continued.
    - Eaton
    - Conrad
    - Hall
    - Emmons
    - Rogers
    - Safford
  - Canada
    - Logan
  - Newfoundland
    - Dana
  - Mississippi valley
    - Hall
    - Winchell
    - Meek
  - Rocky mountains
    - Whitney
    - Bradley
    - Fortieth parallel survey
    - Explorations and surveys west of one hundredth meridian
    - Geological surveys of the territories
    - U. S. geological survey
  - Correlations with European formations
    - De Verneuil
    - Hall
    - Barrande
    - Rogers
    - Bigsby
    - Agassiz
    - Matthew
  - Methods of correlation
    - Superposition
    - Organic remains
      - Life zones
      - Stage of evolution
      - Life history
      - Contemporaneity and homotaxis
      - Percentage of species
    - Lithologic character
    - Unconformity
    - Miscellaneous
      - Homogeny
      - Topographic features

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CONTENTS OF BULLETIN 82.

Page.
smittal 9
s paper 11
.... 13
.... 15
.... 15
y and the criteria of correlation 17
ture of the North American Cretaceous 25
f publications consulted 26
l sketch 61
the formation by regions 72
ion of terms and methods 72
border region 74
Jersey 78
he non-marine division 80
he marine division 82
n island and Long island 84
a's vineyard 86
ylvania and Delaware 87
land and District of Columbia 88
nia 90
Carolina 91
Carolina 92
uding remarks on the Atlantic border region 92
er region 100
ion 114
xican region 130
rior area 140
interior region 154
interior region 164
ower Cretaceous 168
pper Cretaceous 170
rder region 181
ower Cretaceous 183
pper Cretaceous 192
ional districts 201
d taxonomy, illustrated by tables 207
e North American Cretaceous 248
orizon 251
horizon 253
horizon 254
izon 255
rizon 257
and interior horizon 258
do subhorizon 261
na subhorizon 261
orizon 262
on horizon 264
ements of, and volcanic material in, the North American Cretaceous 265
f map 267
.... 269

es published, the 3,000 required by the law relating to these bulletins, tras ordered by the department for free distribution. Price, 20 cents. ntary edition of bulletins 81–82, together, was issued as follows:

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verso blank; index, pp. 161-173. 8°. Plates I and II. The plate which be
number I is placed at p. 146 and is listed as "Plate II," while the plate
bears the number II is placed at p. 60 and is listed as "Plate I."

CONTENTS OF BULLETIN 83.

Letter of transmittal
Outline of this paper
Preface
Introduction
Atlantic and Gulf coast region
  Preliminary remarks
  Historical sketch
  General boundaries
  Stratigraphical and paleontological characteristics
    General remarks
    New Jersey
    Delaware
    Maryland
    Virginia
    North Carolina
    South Carolina
    Georgia
    Florida
    Alabama

oast region—continued.

nd paleontological characteristics—continued.

Page.

.... 66
.... 70
.... 71
.... 73
.... 73
.... 74
.... 75
.... 76
posits........ 79
.... 80
.... 80
.... 80
na 81
na........ 82
.... 82
.... 82
.... 83
.... 83
mbayment........ 83
.... 84
.... 84
esentation of the geological range of the Eocene in the Atlantic and Gulf
n 85
ion into provinces........ 85
rovince 85
rginia province........ 86
rgia province........ 87
e........ 87
European deposits........ 88
.... 90
formation........ 90
.... 92
ania........ 93
.... 93
.... 95
rks 95
.... 96
nd paleontological characteristics........ 100
.... 100
.... 107
eference of the Tejon and Puget groups to the Eocene........ 108
.... 111
rks........ 111
.... 111
nd paleontological characteristics........ 131
rks........ 131
roup........ 132
n beds........ 135
estuary beds 135
beds........ 135
ds........ 136
rk beds 137
ds........ 137
group........ 139
er group 140
r group 140
ls........ 141
eds........ 141
roup........ 141
beds........ 142
up........ 143
lative evidence........ 144
e relative position of the interior deposits in the Eocene series 146

Page.
Bibliography 148
  Atlantic and Gulf coast region 148
  Pacific coast region 155
  Interior region 156
Index 161

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CONTENTS OF BULLETIN 84.

Page.
Letter of transmittal, by G. K. Gilbert 11
Outline of this paper 13
Introduction 15
Chapter I. General considerations 18
  Early classification of American Cenozoic beds 18
  Boundaries of the subdivisions of the Cenozoic 20
    Eocene 20
    Miocene 21
    Pliocene 22
  Geographic provinces of American Neocene 22
    Principles of classification 23

eral considerations—continued.

provinces of American Neocene—continued.

Page.
zones with census of fauna 25
ons from the table 27
ies in correlating faunas 30
ons 31
mary of our knowledge of the Neocene of the Atlantic and Gulf coasts of the considered by states 32
rata off Newfoundland and southward to cape Cod 32
.... 32
hire 33
.... 33
l 34
ts 34
.... 34
on the islands off the mainland 35
ucket 35
nas vineyard 35
hon 38
.... 38
nd 38
.... 39
ene marls 39
sands 43
.... 44
.... 45
.... 49
hore Miocene 49
hore Miocene 49
ene deposits 55
.... 55
tions 56
nsiderations 65
ocks 66
ette formation 66
a 68
ocks 68
ocks 74
a 74
marls 75
ocks 80
.... 81
ocks 81
ocks 84
.... 85
ory 85
of the Florida peninsula 86
aracter and decay of rocks 87
om lines of railway levels 89
ke region 93
ern Florida 95
ern Florida 95
ast of Florida 97
formations 98
glades 99
.... 101
of Florida 101
ks 101
ocks 105
l distribution of the Floridian Miocene 126
eposits 127
deposits 134
iocene beds 140
and recent deposits 149
rock formation 152

Chapter II. Summary of our knowledge of the Neocene of the Atlantic and Gu
United States, etc.—continued.
Florida—continued.
Stratigraphy of Florida—continued.
Scheme of the Floridian Cenozoic rocks
Thickness and dip of the strata
Alabama
Grand gulf group
Lafayette formation
Mississippi
Grand gulf group
Lafayette formation
Louisiana
Grand gulf group
Lafayette formation
Tennessee
Lagrange group
Kentucky
Lagrange group
Illinois
Missouri
Texas
Grand gulf group
Lake beds of the interior
Chapter III. General considerations on the later Atlantic Tertiaries
Correlation of American and exotic Neocene
Classification by Lyell and Deshayes
Growth of the continental border
The Eocene island of Florida
The great Carolina ridge
Contact of Eocene and Miocene
Warm and cold water Miocene
Grand gulf perezone
Lafayette perezone
Pliocene deposits
Table showing the vertical range of the Neocene formations of the Atlantic
Chapter IV. Summary of our knowledge of the Neocene of the Pacific coast
States and Canada, considered by states
California
The Great valley of California
The Livermore valley
Stratigraphy, Coast ranges
Division north of the Golden gate
Division south of the Golden gate
The Sierra nevada
The auriferous gravels
Human remains in the auriferous gravels
Oregon
Pacific border
Columbia river
Willamette river
Washington
Pacific border
Central basin
British Columbia
Neocene of the coast
Neocene of the region east from the Coast ranges
Alaska
General notes on the rocks
Miocene of the Kenai group
Lignitic beds of the Aleutian islands
Cape Beaufort coal-measures
Correlation of the Kenai series
Miocene of the Astoria group
Table showing distribution of the fauna of the Astoria group
Enumeration of special localities

r IV. Summary of our knowledge of the Neocene of the Pacific coast of the United s, etc.—continued.

ska—continued.

Page.
Pliocene 259
    Beds of marine origin 259
    The Ground ice formation 260
    The Kowak clays 265
    Distribution of fossil vertebrates 266
    Origin of the ice and clay formations 266
Volcanic phenomena 266
Notes on the map 268
Pleistocene 268
r V. General considerations on the Cenozoic epoch on the Pacific coast of North America 269
ifornia, Oregon, and Washington 269
tish Columbia 273
ska 276
le indicating conditions existing during Cenozoic time in regard to changes of level and e prevalence of volcanic emissions on the northwest coast 278
le showing the vertical range of the Neocene formations of the Pacific coast 279
r VI. Summary of our knowledge of the supposed Neocene of the interior region of the d States, considered by states 280
gon 280
Fresh-water Tertiaries 280
Pliocene lake beds 282
ho 285
Truckee group 285
Salt lake group 286
ntana 287
Neocene lake beds 287
th Dakota 288
White river beds 288
th Dakota 289
White river group 289
Loup fork group 292
raska 293
Tertiaries of White and Niobrara rivers 293
Loup fork group 296
Pliocene Equus beds 298
Paleontology 290
nsas 299
ian Territory 301
Mexico 301
rado 304
Loup fork and White river groups 304
Pliocene beds 305
Monument creek group 308
oming 309
Cenozoic eruptives 309
Sweetwater Pliocene 310
Wyoming conglomerate 311
White river group 311
h 312
Humboldt group 312
Wyoming conglomerate 313
ada 313
Truckee group 313
Humboldt group 315
le showing the vertical range of the Neocene formations of the interior region 317
es on the map 318
VII. List of names applied to Cenozoic beds and formations of the United States, ex- g the Laramie 320
339

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CONTENTS OF BULLETIN 85.

Page.
Letter of transmittal 11
Outline of this paper 13
Chapter I. Nomenclature 15
  Table of names and correlations 16
Chapter II. Area occupied by the Newark system 19
  Acadian area 19
  Connecticut valley area 20
  Southbury area 20
  New York-Virginia area 20
  Barboursville area 21
  Scottsville area 21
  Danville area 22
  Dan river area 22
  Taylorsville area 22
  Richmond area 22
  Farmville area 23
  Deep river area 23
  Wadesboro area 23
  Summary—areas of distribution 24
Chapter III. Presence or absence of Newark rocks on Prince Edward island 25
  Historical 25
  Discussion of the evidence 27
    Plants 28
    Animals 30
    Other indications of geological position 30
  Conclusions 31
Chapter IV. Lithology and stratigraphy 32
  Conglomerates and breccias 32
  Sandstones, shales, and slates 35
  Limestones 35
  Coal 36
    Quality of coal 36
    Natural coke 37
    Richmond area 38

pter IV. Lithology and stratigraphy—continued.

Coal—continued.

Page.
    Farmville area 40
    Deep river area 41
    Dan river area 42
    Commercial development 42
Thickness of the Newark rocks 43
pter V. Conditions of deposition 45
Physical conditions 45
    Previous interpretations 45
    Conclusions 46
Climatic conditions 47
    Glacial hypothesis 47
    Preservation of glacial records 49
    Weight of the evidence of glaciation 50
    Indications of a mild climate 52
    Conclusions 53
Résumé 53
pter VI. Life records 54
Mammals 54
Batrachians and reptiles 54
Fishes 56
nsects 58
Crustaceans 59
Mollusks 60
Footprints 61
Plants 62
pter VII. Associated igneous rocks 66
Mineralogical composition 66
Chemical composition 68
Characteristics of trap dikes 69
Characteristics of trap sheets 69
Geographical distribution 70
    Trap dikes outside the Newark areas 70
    Trap rocks of the Acadian area 72
    Trap rocks of the Connecticut valley area 73
    Trap rocks of the New York-Virginia area 74
    Trap rocks of the Newark areas south of the New York-Virginia area 76
ummary respecting the distribution and age of the trap rocks 76
pter VIII. Deformation 78
ntroduction 78
Structure of the Acadian area 80
Structure of the Connecticut valley area 80
Structure of the Southbury area 81
Structure of the New York-Virginia area 83
Structure of the Barboursville, Scottsville, Danville, and Dan river areas 85
Structure of the Farmville area 88
Structure of the Richmond area 89
    Previous observations 89
    Personal observations 90
        Section along the James river 90
        West border of the area 91
        East border of the area 92
        Failures in mining due to geological structure 93
        Absence of oil and gas 94
Structure of the Deep river area 94
Structure of the Wadesboro area 95
Summary 97
Origin of fault structure 98
pter IX. Former extent 101
The local-basin hypothesis stated 101
The broad-terrane hypothesis stated 103
Evidence favoring the local-basin hypothesis 104
Evidence favoring the broad-terrane hypothesis 104
Objections to the broad-terrane hypothesis 106
Conclusion 107

Chapter X. Correlation
- General principles
  - Physical phenomena as a basis of correlation
    - Superposition
    - Contained fragments
    - Relation to systems of folds, faults, and dikes
    - Relation to uncomformities
    - Relation to glaciation
    - Lithological similarity
    - Summary concerning physical phenomena
    - Chemical phenomena considered
  - Life records as a basis of correlation
    - Imperfections of the geological record
    - Imperfections of our knowledge of the geological record
    - Influence of distribution on the life records
    - The life record continuous
    - The European standard
- Principles on which widely separated terranes may be correlated
- Manner in which American terranes have been correlated
- Correlation of the Newark system
  - Relation to terranes in the western part of the United States
  - Relation to European terranes
    - Testimony of the vertebrates
    - Testimony of the crustaceans
    - Testimony of the plants

Summary
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Literature of the Newark system

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introduction, pp. 19-22; text, pp. 23-529, verso blank; inde
Plates I-XII.

CONTENTS OF BULLETIN 86.

Letter of transmittal
Outline of this paper
Preface

Page.
roduction 19
pter I. The original Laurentian and Huronian areas 23
Section I. Eastern Ontario and western Quebec 23
  Literature 23
  Summary of results 32
Section II. From north channel of lake Huron to lake Temiscaming 35
  Literature 35
  Summary of results 46
  Notes 48
pter II. Lake Superior region 51
Section I. Work of the official geologists of the Canadian survey and associates 51
Section II. Work of the early United States geologists and associates 72
Section III. Work of the Michigan geologists and associates 88
Section IV. Work of the Wisconsin geologists and associates 105
Section V. Work of the Minnesota geologists and associates 119
Section VI. Work of the later United States geologists and associates 134
Section VII. Summary of results 156
  Lake Superior sandstone 157
  The character of the Keweenaw series 160
  Relations of Keweenaw and underlying series 161
  General succession according to different writers 162
  Lithological characters of Azoic, Laurentian, Huronian, etc 167
  Origin of the iron ores 170
  The basic eruptives and stratigraphy 173
  Unconformity at base of clastic series 174
  Unconformity within clastic series 179
  Correlation; general considerations 183
  Equivalents of the original Huronian series 184
  Equivalents of the Sioux quartzites, St. Louis slates, etc 186
  Succession and equivalents of the Penokee and Animikie districts series 187
  Succession and equivalents of the Marquette district series 189
  Succession and equivalents of the Menominee and Felch mountain districts series 190
  Equivalents of the Black river falls series 190
  Succession and equivalents of western Ontario and northeastern Minnesota series 190
  Nomenclature 191
  Lake Superior basin 196
  Conclusion 196
  Notes 199
pter III. The great northern area 209
Section I. The region about Hudson bay 209
  Literature 209
  Summary of results 212
Section II. Northern Canada 213
  Literature 216
  Summary of results from Dawson 217
Section III. The lower St. Lawrence river and westward to lakes St. John and Mistassini. 218
  Literature 218
  Summary of results 220
  Notes 220
pter IV. Eastern Canada and Newfoundland 223
Section I. The eastern townships 223
  Literature 223
  Summary of results 226
Section II. Gaspé peninsula 227
  Literature 227
Section III. Central New Brunswick 227
  Literature 227
  Summary of results 229
Section IV. Southern New Brunswick 230
  Literature 230
  Summary of results 236
Section V. Nova Scotia and Cape Breton 239
  Literature 239
  Summary of results 244

Chapter IV. Eastern Canada and Newfoundland—continued. Page.

Section VI. Newfoundland 247
Literature 247
Summary of results 251
Notes 252
Chapter V. Isolated areas of the Mississippi valley 257
Section I. The Black hills 257
Literature 257
Summary of results 260
Section II. Missouri 261
Literature 261
Summary of results 265
Section III. Texas 266
Literature 266
Summary of results 269
Notes 270
Chapter VI. The Cordilleras 272
Section I. Laramie, Medicine bow, and Park ranges in southern Wyoming 272
Literature 272
Summary of results 276
Section II. Central and western Wyoming 277
Literature of the Big horn mountains 277
Literature of the Rattlesnake mountains 278
Literature of the Sweetwater and adjacent mountains 278
Literature of the Wind river mountains 279
Literature of the Gros ventre and Wyoming ranges 280
Literature of the Teton range 281
Summary of results 281
Section III. Central and southwestern Montana, with adjacent parts of Wyoming and Idaho 282
Literature 282
Summary of results 286
Section IV. Utah and southeastern Nevada 286
Literature of the Uinta mountains 286
Literature of the Wasatch mountains 289
Literature of the Promontory ridge, Fremont island and Antelope island ranges 295
Literature of the Oquirrh mountains 295
Literature of the Aqui mountains 296
Literature of the Raft river range 296
Literature of southern Utah and southeastern Nevada 296
Summary of results 297
Section V. Nevada north of parallel 39° 30′ 299
Literature 299
Summary of results 306
Section VI. Colorado and northern New Mexico 308
Literature of the Front range, north and east of the Arkansas 308
Literature of the West and Sangre de Cristo mountains 313
Literature of the Front range of southern Colorado and northern New Mexico 314
Literature of the Park range 316
Literature of the Sawatch mountains 316
Literature of the Elk mountains 317
Literature of the Grand and Gunnison rivers 318
Literature of the Quartzite mountains 319
Literature of the La Plata mountains 323
Summary of results 324
Section VII. Arizona and western New Mexico 326
Literature 326
Summary of results 330
Section VIII. California, Washington, and British Columbia 332
Literature of California, with adjacent parts of Nevada and Arizona 332
Literature of Washington 337
Literature of British Columbia 337
Summary of results 341
Notes 342

Page.
ter VII. Eastern United States 348
ection I. The New England states 348
  Literature of Maine 348
  Literature of New Hampshire 350
  Literature of Vermont 355
  Literature of Massachusetts 361
  Literature of Rhode Island 377
  Literature of Connecticut 377
  General literature 379
  Summary of results 382
ection II. The middle Atlantic states 386
  Literature of New York 386
  Literature of New Jersey 399
  Literature of Pennsylvania 404
  Literature of Maryland 410
  Literature of Delaware 412
  General literature 413
  Summary of results 413
ection III. The southern Atlantic states 416
  Literature of the Virginias 416
  Literature of North Carolina 418
  Literature of Tennessee 422
  Literature of South Carolina 423
  Literature of Georgia 425
  Literature of Alabama 426
  General literature 427
  Summary of results 427
  Notes 429
ter VIII. General successions and discussions of principles 440
ection I. Literature 440
ection II. General discussion 470
  Names applied to pre-Cambrian rocks 470
  The character of the Archean 475
  Origin of the Archean 478
  Delimitations of Archean 484
  Stratigraphy of Archean 487
  Necessity for a group between Cambrian and Archean 491
  Delimitations of the Algonkian 493
  Difficulties in Algonkian stratigraphy 496
  The original Laurentian and associated areas 497
  The original Huronian 498
  Lake Superior region 499
  The region about Hudson bay 500
  Other regions of northern Canada 501
  The eastern townships 501
  Southern New Brunswick 502
  Nova Scotia and Cape Breton 502
  Newfoundland 503
  The Black hills 503
  Missouri 504
  Texas 504
  Medicine bow range 504
  Southwestern Montana 504
  The Uinta mountains 505
  The Wasatch mountains 505
  Promontory ridge, Antelope and Fremont islands 506
  The Aqui mouatains 506
  Schell creek, Egan, Pogonip or White pine, and Piñon ranges 506
  Front range of Colorado 506
  The Quartzite mountains 507
  Grand canyon of the Colorado 507
  British Columbia 507
  The Adirondacks 508
  Other Algonkian areas 503

Chapter VIII. **General successions and discussions of principles—continued.**
Section II. **General discussion—continued.** Page.

Subdivisions of Algonkian 509
Comparison with other classifications 509
Principles applicable to Algonkian stratigraphy 511
Results in America and Europe compared 524
Notes 527
Index 531

3,000 copies published, the number required by the law relating to these bulletins. Price, 25 cents.

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CONTENTS OF BULLETIN 90.

Page.

On the constitution of certain micas, vermiculites, and chlorites. By F. W. Clarke and E. A. Schneider 11
New analyses of uraninite. By W. F. Hillebrand 22
On the isomorphism and composition of thorium and uranous sulphates 26
    I. Chemical discussion. By W. F. Hillebrand 26
    II. Crystallographic discussion. By W. H. Melville 31
Powellite—calcium molybdate: a new mineral species. By W. H. Melville 34
Mineralogical notes. By W. H. Melville 38
    Natrolite from Magnet cove, Arkansas 38
    Tourmaline from Nevada county, California 39
    Spessartite garnet from Llano county, Texas 39
    Bismuthinite from Sinaloa, Mexico 40
New analyses of astrophyllite and tschefflkinite. By L. G. Eakins 41
Two new meteorites. By L. G. Eakins 45
    I. Meteoric iron from Pulaski county, Virginia 45
    II. Stone from Washington county, Kansas 45
On the action of phosphorus oxychloride on the ethers and chlorhydrines of silicic acid. By H. N. Stokes 47
On the colloidal sulphides of gold. By E. A. Schneider 56

Page.
yses ... 62
from Colorado ... 62
nite from Arkansas ... 62
s from the zinc region of Missouri and Kansas ... 63
... 65
... 65
and dolomites ... 66
n Maryland ... 66
from Kentucky ... 67
rom Missouri ... 68
m Minnesota ... 68
orado ... 69
ntana ... 70
zona ... 72
eka, Nevada ... 72
ifornia ... 73
ensland ... 74
Florida ... 74
West Virginia ... 74
rom West Virginia ... 75
Utah ... 75

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BULLETIN 91.

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| government printing office | 1891

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CONTENTS OF BULLETIN 92.

Page

Letter of transmittal.......... 13

Preface.......... 15

Chapter I. Fluid volume: its dependence on pressure and temperature.......... 17

- Introduction.......... 17
  - Literature of compressibility.......... 17
  - Literature of heat expansion.......... 19
  - Remarks on the literature.......... 20
- Apparatus.......... 20
  - Force pump and appurtenances.......... 20
  - Pressure tube and appurtenances.......... 20
  - Method of charging the tube.......... 21
  - Method of heating.......... 22
  - Pressure measurement.......... 23
  - Volume changes of the glass tubes.......... 25
  - Mercury tests.......... 25
  - Isothermals and adiabatics.......... 26
  - Thermal expansion.......... 27
- Experimental results.......... 28
  - Explanation.......... 28
  - Ether.......... 28
  - Alcohol.......... 30
  - Palmitic acid.......... 32
  - Para-toluidine.......... 33
  - Diphenylamine.......... 34
  - Caprinic acid.......... 35
  - Benzoic acid.......... 35
  - Paraffin.......... 36
  - Thymol.......... 37
  - Naphthalene.......... 40
- Method of discussion.......... 42
  - Plan pursued.......... 42
  - Quadratic constants.......... 42
- Compressibility increasing inversely as the pressure binomial.......... 43
  - Transition to exponential constants.......... 43
  - Properties of the exponential equation.......... 44
  - Exponential constants computed.......... 46
  - Mean exponential constants derived.......... 48
  - Subsidiary results.......... 49
  - Isothermals computed.......... 50
  - Isometrics.......... 54
- Digression on thermal expansion.......... 55
  - Exponential equation proposed.......... 55
  - Observed contractions due to cooling under pressure.......... 56
- Compressibility increasing inversely as the second power of the pressure binomial.......... 61
  - Properties of the hyperbolic equation.......... 61
  - Presumptive character of the isometrics.......... 62
  - Hyperbolic constants computed.......... 63
  - Mean hyperbolic constants derived.......... 64
  - The isothermal band.......... 65
  - Conclusion.......... 66

Page.
ffect of pressure on the electrical conductivity of mercury 68
68
f the work 68
69
s and results 69
ubes described 69
pparatus 70
y data 70
for volume changes of tube 71
r result stated 71
hods and results 72
zometer described 72
73
74
mal variation of resistance 74
with J. J. Thomson's equation 75
tance 75
ressure measurement 75
nt of melting point and pressure 76
76
ompressibility of water above 100° and its solvent action on glass 78
78
water 78
Compressibility of water 78
Solvent action of water 79
urement and results 79
79
ature data 80
rature data 80
of these results 81
rature measurement repeated 82
of these results 82
83
olution of vulcanized india rubber 85
lication 85
on disulphide 86
ds of the paraffin series 87
entine 87
roform and carbon tetrachloride 87
ne 88
al oils 88
glycerin 88
ol and higher aromatic hydrocarbons 88
ylic and higher ethers 88
alcohols 88
ketones 88
water and mineral acids 88
ulcanization. Liquid ebonite 89
ures of solvents, and solution of mixed gums 89
zation 90
gnated rubber 90
ents and solvents 92
results 93
litions regarding the solution of carbon, etc 93
95

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BULLETIN 93.

Department of the interior | Bulletin | of the | United
gical survey | no. 93 | Some insects of special interest
t, | Colorado, and other points in the Ter- | tiaries of Colo-
n |
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CONTENTS OF BULLETIN 93.

Page.
Letter of transmittal 9
Introduction 11
Genera and species 12
  Neuroptera—Odonata 12
    Trichocnemis Selys 12
      Trichocnemis aliena 12
    Stenogomphus, gen. nov 13
      Stenogomphus carletoni 14
  Hemiptera—Cicadidæ 15
    Cicada Linné 15
      Cicada grandiosa 15
  Coleoptera—Byrrhidæ 16
    Nosotetocus, gen. nov 16
      Nosotetocus marcovi 17
  Coleoptera—Carabidæ 17
    Carabites Heer 17
      Carabites examinus 17
  Diptera—Œstridæ 18
    Palœstrus, gen. nov 18
      Palœstrus oligocenus 19
  Diptera—Mycetophilidæ 19
   Mycetophætinæ 19
    Mycetophætus, gen. nov 20
      Mycetophætus intermedius 20
  Lepidoptera—Nymphalidæ 20
   Libytheinæ 20
    Barbarothea, gen. nov 21
      Barbarothea florissanti 23
  Hymenoptera—Tenthredinidæ 24
    Atocus, gen. nov 24
      Atocus defessus 25

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CONTENTS OF BULLETIN 94.

Page.
l 13
.... 15
, drawn, and other strains in their bearing on Maxwell's theory of viscosity. 17
.... 17
.... 18
wires 18
ed wires 24
.... 26
o species of molecular break-up which promote viscous deformation 30
.... 30
ing defined 30
esistance, and viscosity 31
resistance, and viscosity 31
temper, electric resistance, and viscosity 31
sults 33
wisting 33
sults of cyclic twisting 37
feature 37
h thermal annealing 38
ffect of mechanical strain on the carburation of steel 40
.... 40
periments 40
method 40
iment 41
.... 41
.... 42
.... 44
of the results 44
method 45
.... 45
n of acid 45
r and in hydrogen 45
ion 46
ensity 46
.... 46
nd β iron 47
ect of strain on the rate of solution of steel 48
.... 48
.... 48
.... 49
.... 57
ors 57
ace 58
sion 58

Chapter IV. The effect of strain on the rate of solution of steel—continued.
Discussion—continued. Page.
Wires originally soft 59
Wires annealed 60
Relation to Drowne's inferences 61
Summary 61
Chapter V. The hydroelectric effect of changes of molecular configuration 63
Introductory 63
Apparatus 63
Experiments 64
Zero method 64
Results for iron 64
Discussion of results 66
Data for divers metals 66
Effects classified 69
Discussion of errors 70
Variable capacity 70
Single wires 72
Summary 72
Chapter VI. Secular annealing of cold hard steel 74
Introductory 74
Results for homogeneity of rods 75
Mass constants of rods 76
Electrical constants of rods 77
Summary 79
Chapter VII. The viscosity of electrolyzing glass 80
Apparatus 80
Results 81
Inferences 82
Chapter VIII. The electrical resistance of stressed glass 85
Introductory 85
Apparatus 85
Experiments 86
Data for 350° 86
Data for 100° 86
Data for 185° 88
Results of twisting 89
Differential apparatus 89
Results for torsion 91
Character of traction effects 91
Results for traction at 190° 91
Discussion of these results 92
Traction at 100° 94
Further results at 100° 95
Dimensional change due to torsion 96
Effect of temperature 96
Traction at 360° 97
Summary 98
Degree of molecular instability of glass 99
Chapter IX. The energy potentialized in permanent changes of molecular configuration 101
Introductory 101
Apparatus 101
Results 103
Discussion of errors 104
Successive stretching 105
Results of improved methods 106
Summary 107
Chapter X. The chemical equilibrium of solids in its relation to pressure and to temperature 109
Earlier researches 109
Apparatus 110
Compressor 110
Vapor baths 110
Insulation 110
The resistance tube 111
Arrangement for testing insulation 113
Digression 113
Resistance measurement 114

ter X. The chemical equilibrium of solids in its relation to pressure, etc.—continued.

pparatus—continued. Page.
Galvanometer 114
Other adjustments 114
bservations 114
Tables explained 114
Remarks on the table 115
Electromotive force 116
Remarks on the table 116
Pressure coefficient of sperm oil 117
Pressure coefficient of gasoline 117
Pressure coefficient of petroleum 118
Pressure coefficient of thin machine oil 120
Pressure coefficient of thick machine oil 122
Digest 123
eductions 124
Effect of pressure 124
Temporary and permanent effects 124
Chart 125
Pressure and chemical equilibrium 125
Effect of temperature 125
Molecular effects of stress 125
Hysteresis 126
Magnetic hysteresis 127
Mechanism of viscosity 128
Electrical effects of æolotropic stress 130
navoidable errors 130
Polarization 130
Insulators 130
Shifting isothermal planes 130
Electromotive force 131
Short-circuiting 132
Electromotive force and pressure 132
Graphic representation 133
Electric instability of hydrocarbon oils 134
onclusion 135
ndex 137

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CONTENTS OF BULLETIN 95.

Page.
Introduction 9
  Instruments 9
  Scale of measurements 10
  Differences of intensity 10
  Stations 12
Chronological record, 1890 12
Chronological record, 1891 20

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CONTENTS OF BULLETIN 96.

Page.
Letter of transmittal 13
Preface 15
Chapter I. Method of obtaining and of measuring very high pressures 17
  Introduction 17
  The screw compressor 18
    General method 18
    Special devices 18
    Steel screw 18
    Barrel. Head 19
    Barrel. Head, improved 19
    Barrel. Body 20
    Barrel. End with piezometer tube 20
    Piezometer tube. Vapor bath 20
    Method of filling 20
    Case for protection 21
    Vertical piezometer 21
  Pressure measurement 22
    Tait gauge. Adjustment 22
    Tait gauge. Graduation 23
    Tait gauge. Volume increase measured and computed 29
    Direct reading, Bourdon gauge 30
    Concluding remarks 31
Chapter II. The isometrics of liquids 33
  Introduction 33
  Apparatus 33
    Constant volume tube 33

er II. The isometrics of liquids—continued.

pparatus—continued.

Page.
  Manipulation 34
  Method of filling 35
  Vapor baths 36
  Method of cooling piezometer 37
  Method of temperature measurement 38
  Method of pressure measurement 38
reliminary results 38
  Data for ether 38
  Discussion 39
efinite results 40
  Apparatus improved 40
  Notation 41
  Data for ether 41
  Method of purifying 42
  Observations for ether 42
  Observations for alcohol 44
  Observations for thymol, para-toluidine, and diphenylamine 45
emperatures corrected 46
  Behavior of the torsion galvanometer 46
  Air thermometer comparisons. Apparatus 47
  Air thermometer comparisons. Observations 48
  Isometrics corrected as to temperature 51
  Correction for the thermal and elastic volume changes of the glass tubes 54
  Thermal expansion of glass 54
  Compressibility of glass 55
  Compressibility of the above liquids 55
eductions 58
  Curvature and slope of the isometrics 58
  Final interpretation 60
  Isometrics of solid glass 61
  Conclusion 62
ter III. A comparison of the Bourdon, the Tait, and the Amagat high-pressure gauges 63
istorical 63
  The earlier work 63
  Amagat's manometer 63
  Bourdon gauge 64
iscussion of results 65
  Multiplying mechanism 65
  Fraunhofer micrometer 66
  Tait gauge 67
mmary 69
er IV. The continuity of solid and liquid 71
troductory 71
  Scope of the work 71
  Other methods tested 72
  Advantages of the present method 73
pparatus 73
  Temperature 73
  Pressure 74
  The volume tube 74
ethod of measurement 77
  Constants of the tube 77
  Volume of the charge 78
  Correction for expansion and compressibility of envelopes 78
  Resistance measurement 79
  Calibration 79
  Electrolytic resistance and temperature 80
  Volume in terms of resistance 82
  Pressure coefficient of the electrolyte 82
esults of the measurements 83
  Arrangement of the tables 83
  Solid isothermal, 63° 84
  Liquid-solid isothermals, 80° 85
  Liquid-solid isothermals, 90° 85
  Liquid-solid isothermals, 100° 86
  Liquid-solid isothermals, 117° 87

Chapter IV. The continuity of solid and liquid – continued.

Results of the measurements—continued. Page.
Liquid-solid isothermals, 130° 88
Deductions 89
Graphic construction 89
Hysteresis 89
James Thomson's double inflections 90
The characteristic specific volumes 91
Critical point 92
Solidifying points and melting points 93
Transitional point 94
Solubility and pressure 95
Conclusion 96

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CONTENTS OF BULLETIN 97.

Page.
Letter of transmittal 9
Preface 11
Introduction 13
Bibliography 15
Systematic review 21
Crinoidea 21
Uintacrinidæ 21
Apiocrinidæ 24
Pentacrinidæ 25
Asteroidea 29
Ophiuridæ 29
Stelleridæ 31
Echinoidea 33
Euechinoidea 33
Regulares 33
Cidaridæ 33
Salenidæ 40
Diadematidæ 44
Echinidæ 54

ematic review—continued.
Echinoidea—continued. Page.
  Irregulares ... 58
    Echinoconidæ ... 58
    Cassidulidæ ... 59
    Holasteridæ ... 74
    Spatangidæ ... 78
Doubtful and unrecognized species ... 92
logical distribution ... 94
logue of specific names employed by writers upon the Mesozoic Echinodermata of the nited States ... 95
es ... 103
x ... 205

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CONTENTS OF BULLETIN 98.

Page.
er of transmittal ... 9
ine of this paper ... 10
oduction ... 11
Geological ... 11
  Localities ... 11
  Mode of occurrence ... 12
Paleontological ... 15
ription of species ... 17
I. Vascular cryptogams ... 17
  Equisetineæ ... 17
    Calimariæ ... 17
      Calamites ... 17
      Annularia ... 25
      Sphenophyllum ... 35
      Pinnularia (Hydatica) ... 43

Description of species—continued.
- I. Vascular cryptogams—continued. Page.
  - Filicineæ 43
    - Sphenopterideæ 43
      - Diplothmemæ 43
      - Diplothmema 44
      - Mariopteris 46
      - Sphenopteris 52
    - Pecopterideæ 60
      - Pecopteris 60
    - Neuropterideæ 68
      - Neuropteris 68
      - Dictyopteris 99
    - Anomalous forms 101
      - Aphlebia 101
  - Lycopodineæ 103
    - Sigillariæ 103
      - Sigillaria 103
- II. Phanerogams 105
  - Gymnospermæ 105
    - Cordaiteæ 105
      - Cordaites 105
      - Cordaianthus 106
      - Cordaicarpus 107

Results 109
- Difficulties in correlation of western terranes with eastern series by means of fossil plants 109
- Distribution of the species 110
  - Summary table 116
- Age of the outliers as determined by the distribution and facies of the flora 117

Conclusions 120
Plates with descriptions 134
Index 135

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At this writing bulletin 98 has not been delivered by the printer; the foregoing description of it has been made up from final page proofs, and may not be errorless. Its price will be 15 cents.

BULLETIN 99.

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Washington | government printing office | 1892

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CONTENTS.

Page.
mary .... xi–xvii
.... 1–107
General view of the coal-mining industry 1–7
Anthracite 7–32
  Description and production of the anthracite coal fields of Pennsylvania, by Chas. A. Ashburner 7–24
Bituminous coal 33–107
  Analyses and calorific values of some Utah coals, by Ellsworth Daggett 76–81
.... 108–171
Iron ore and its products, by James M. Swank 108–144
Iron in the Rocky mountain division 144–148
Iron on the Pacific coast 148
The iron ores of Alabama in their geological relations, by Eugene A. Smith 149–161
Utilization of blast-furnace slag 161–164
The Bower-Barff process, by A. S. Bower 164–171
and silver 172–185
oleum 186–212
Petroleum, by S. H. Stowell 186–211
Petroleum in the Rocky mountain division 211–212
per 213–305
The copper industry of the United States, by C. Kirchhoff, jr 213–257
The metallurgy of copper, by James Douglas, jr 257–280
The roasting of copper ores and furnace products, by Edward D. Peters, jr 280–297
Bluestone 297–305
  The manufacture of bluestone at the Lyon mill, Dayton, Nevada, by J. E. Gignoux 297–305
d 306–345
The lead industry of the United States, by C. Kirchhoff, jr 306–323
The smelting of argentiferous lead in the far west, by O. H. Hahn 324–345
.... 346–386
The zinc industry of the United States, by C. Kirchhoff, jr 346–358
The mining and metallurgy of zinc in the United States, by F. L. Clerc 358–386
ksilver 387–398
el, by W. P. Blake 399–420
alt, by F. W. Taylor 421–423
ganese, by David T. Day 424–427
mium, by David T. Day 428–430

Tungsten, by David T. Day
Tin
Antimony
Bismuth
Arsenic
Platinum
Iridium, by F. W. Clarke
Aluminum, by R. L. Packard
Molybdenum
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CONTENTS.

Page
Summary 1-10
Coal 11-213
  Anthracite coal mining, by H. M. Chance 104-131
  Coal mining in the Kanawha valley of West Virginia, by Stuart M. Buck 131-143
  The manufacture of coke, by Joseph D. Weeks 144-213
Petroleum, by S. H. Stowell 214-232
Natural gas 233-245
Iron 246-311
  The manufacture of iron and steel in the United States, by James M. Swank 246-257
  Iron ores in the United States, by James M. Swank 257-281
  Iron in the Rocky mountain division, by F. F. Chisolm 281-286
  Iron on the Pacific coast, by C. G. Yale 286-290
  American blast-furnace progress, by John Birkinbine 290-311
Gold and silver 312-321
Copper 322-410
  The copper industry of the United States, by C. Kirchhoff, jr 322-374
  The mines and reduction works of Butte city, Montana, by E. D. Peters, jr 374-396
  The cupola smelting of copper in Arizona, by James Douglas, jr 397-410
Lead 411-473
  The lead industry of the United States, by C. Kirchhoff, jr 411-440
  Lead slags, by Malvern W. Iles 440-462
  Recent improvements in desilverizing lead in the United States, by H. O. Hofman 462-473
Zinc. The zinc industry of the United States, by C. Kirchhoff, jr 474-491
Quicksilver 492-536
  Quicksilver reduction at New Almaden, by Samuel B. Christy 503-534
Nickel, by W. P. Blake 537-543
Cobalt, by David T. Day 544-549
Manganese, by David T. Day 550-566
Chromium, by David T. Day 567-573
Tungsten, by David T. Day 574-575
Platinum 576-580
Iridium, by William L. Dudley 581-591
Tin, by W. P. Blake 592-640
Antimony, by W. P. Blake 641-653
Bismuth 654-655
Arsenic 656-657
Aluminum, by R. L. Packard 658-660
Zirconium, by David T. Day 661
Structural materials 662-711
  Building stone 662-667
  Building sand 667-668
  Lime 668-670
  Cement 671-676
  Clays, by F. A. Wilber 676-711

	Page.
Abrasive materials	712–722
Buhrstones	712–713
Grindstones	713–714
Corundum and emery, by T. M. Chatard	714–720
Infusorial earth	720–721
Pumice stone	721
Rottenstone	722
Precious stones, by George F. Kunz	723–782
Fertilizers	783–826
Phosphate rock, by David T. Day	783–805
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Apatite	805–808
Marls, by F. A. Wilber	808
Gypsum, by F. A. Wilber	809–815
Manufactured fertilizers, by David T. Day	815–826
Salt	827–850
Bromine, by David T. Day	851–853
Iodine, by David T. Day	854–858
Borax	859–863
Sulphur, by David T. Day	864–876
Pyrites, by William Martyn	877–905
Mica, by F. W. Clarke	906–912
Asbestus	913–914
Graphite, by John A. Walker	915–919
Mineral paints	920–929
Chalk	930–932
Feldspar, by David T. Day	933, 934
Lithographic stone	935, 936
Asphaltum	937–948
The asphaltum deposits of California, by E. W. Hilgard	938–948
Alum	949, 950
Bluestone	951
Copperas	952, 953
Cryolite	954
Ozocerite	955–957
Glass materials, by Joseph D. Weeks	958–977
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CONTENTS.

	Page.
Summary	1-9
Coal, by Charles A. Ashburner	10-73
The manufacture of coke, by Joseph D. Weeks	74-129
Petroleum, by S. H. Stowell	130-154
Natural gas, by Joseph D. Weeks	155-179
Iron	180-199
Twenty-one years of progress in the manufacture of iron and steel in the United States, by James M. Swank	180-195
Iron in the Rocky mountain division, by F. F. Chisolm	196
Iron on the Pacific coast, by C. G. Yale	196-199
Gold and silver	200-207
Copper. The copper industry of the United States, by C. Kirchhoff, jr	208-243
Lead. The lead industry of the United States, by C. Kirchhoff, jr	244-271
Zinc. The zinc industry of the United States, by C. Kirchhoff, jr	272-283
Quicksilver	284-296
Nickel	297-302
Manganese, by Jos. D. Weeks	303-356
Chromium, by David T. Day	357-360
Cobalt, by David T. Day	361-365
Tungsten, by David T. Day	366
Platinum and iridium	367-369
Tin	370-385
Arsenic	386
Antimony	387-388
Bismuth	389
Aluminum, by R. L. Packard	390-392
Zirconium, by David T. Day	393-394
Structural materials, by H. S. Sproull	395-427
Abrasive materials	428-436
Buhrstones	428
Grindstones	428-429
Corundum	429-432
Infusorial earth	433
Pumice stone	433
Novaculite, by George M. Turner	433-436
Precious stones, by George F. Kunz	437-444
Fertilizers	445-473
Phosphate rock, by David T. Day	445-455
Apatite	456-458
Gypsum, by H. S. Sproull	458-464
Marls	464
Manufactured fertilizers	465-473
Salt	474-485
Bromine, by David T. Day	486-487
Iodine, by David T. Day	488-490
Borax	491-493
Sulphur, by William C. Day	494-500
Pyrites, by Herbert J. Davis	501-517
Mica	518-520
Asbestus	521-522
Feldspar, by William C. Day	523
Mineral paints, by Marcus Benjamin	524-533
Talc, by G. F. Perrenoud	534-535
Mineral waters, by A. C. Peale	536-543
Glass materials, by Jos. D. Weeks	544-557

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CONTENTS.

	Page.
Summary	1-10
Iron	11-103
The American iron trade in 1886, by James M. Swank	11-22
The American iron industry from the beginning in 1619 to 1886, by James M. Swank	23-38
The iron ores east of the Mississippi river, by John Birkinbine	39-103
Gold and silver	104-108
Copper, by C. Kirchhoff, jr	109-139
Lead, by C. Kirchhoff, jr	140-153
Zinc, by C. Kirchhoff, jr	154-159
Quicksilver	160-168
Nickel	169-173
Cobalt	174-175
Chromium	176-179
Manganese, by Jos. D. Weeks	180-213
Tin	214-217
Tungsten	218-219
Aluminum, by R. L. Packard	220-221
Platinum and iridium	222-223
Coal, by Charles A. Ashburner	224-377
The manufacture of coke, by Jos. D. Weeks	378-438
Petroleum, by Jos. D. Weeks	439-487
Natural gas, by Jos. D. Weeks	488-516
Structural materials, by Wm. C. Day	517-580
Abrasive materials	581-594
Buhrstones, by William A. Raborg	581-582
Grindstones, by William A. Raborg	582-585
Corundum, by William A. Raborg	585-586
Infusorial earth	587-588
Novaculite, by George M. Turner	589-594
Precious stones, by George F. Kunz	595-605
Fertilizers	606-627
Phosphate rock	607-610
The fertilizer trade in North Carolina in 1886, by W. B. Phillips	611-617
Marls	619-620
Gypsum	620-623
Manufactured fertilizers	623-627
Salt, by William A. Raborg	628-641
Bromine	642-643
Sulphur, by Wm. C. Day	644-647
Tellurium	648-649
Pyrites, by Richard P. Rothwell	650-675
Phosphorus, by George M. Turner	676-677
Borax	678-680
Alum	681-682
Bluestone	683
Copperas	684-685
Graphite, by William A. Raborg	686-689
Lithographic stone	690-691
Fluorspar	692-693
Magnesium	694-698
Strontium	699-700
Feldspar, by Wm. C. Day	701
Mineral paints, by Marcus Benjamin	702-714
Mineral waters, by A. C. Peale	715-721
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CONTENTS.

	Page.
Summary	1–9
Iron	10–57
The iron and steel industries of the United States in 1887 and 1888, by James M. Swank	10–27
Iron in the Rocky mountain division, by F. F. Chisolm	28–29
Iron ore mining in 1887, by John Birkinbine	30–57
Gold and silver	58–65
Copper, by C. Kirchhoff, jr	66–97
Lead, by C. Kirchhoff, jr	98–112
Zinc, by C. Kirchhoff, jr	113–117
Quicksilver	118–125
Nickel	126–129
Cobalt	130–131
Chromium	132–133
Tin	134–137
Aluminum, by R. L. Packard	138–141
Platinum	142–143
Manganese, by Joseph D. Weeks	144–167
Coal, by Charles A. Ashburner	168–382
The manufacture of coke, by Joseph D. Weeks	383–435
Petroleum, by Joseph D. Weeks	436–463
Natural gas, by Joseph D. Weeks	464–502
Structural materials, by William C. Day	503–551
Abrasive materials	552–554
Precious stones, by George F. Kunz	555–579
Fertilizers	580–594
Gypsum	595–603
Gypsum or land plaster in Ohio, by Edward Orton	596–601
Sulphur, by William C. Day	604–610
Salt, by William A. Raborg	611–625
Bromine	626–627
Potassium salts, by William C. Day	628–650
Sodium salts, by William C. Day	651–658
Fluorspar	659
Mica	660–671
Mica mining in North Carolina, by William B. Phillips	661–671
Graphite	672–673
Mineral paints	674–679
Mineral waters, by A. C. Peale	680–687
Useful minerals of the United States, edited by Albert Williams, jr	688–812

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CONTENTS.

	Page.
Summary	1-11
Iron	12-35
The iron and steel industry of the United States in 1888 and 1889, by James M. Swank	12-32
Iron in the Rocky mountain division, by F. F. Chisolm	33-35
Gold and silver	36-42
Copper, by C. Kirchhoff, jr	43-77
Lead, by C. Kirchhoff, jr	78-91
Zinc, by C. Kirchhoff, jr	92-96
Quicksilver	97-107
Nickel	108-118
Chromium	119-122
Manganese, by Joseph D. Weeks	123-143
Tin	144-159
Aluminum, by R. L. Packard	160-164
Platinum	165-167
Coal, by Charles A. Ashburner	168-394
Arkansas, by Arthur Winslow	216-224
Dakota, by F. F. Chisolm	240
Illinois, by J. S. Lord	242-256
Wyoming, by F. F. Chisolm	390-394
The manufacture of coke, by Joseph D. Weeks	395-441
Petroleum, by Joseph D. Weeks	442-480
Natural gas, by Joseph D. Weeks	481-512
Asphaltum	513-514
Ozokerite	515
Structural materials, by William C. Day	516-575
Abrasive materials	576-579
Precious stones, by George F. Kunz	580-585
Fertilizers	586-596
Salt, by William A. Raborg	597-612
Bromine	613
Mica	614-615
Mineral paints	616-622
Mineral waters, by A. C. Peale	623-630

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Documentary edition as follows:

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Washington | government printing office | 1890

Paper cover bearing title as above; sample library catalogue slips, advertisement, notice, title, contents, and remainder of collation precisely as in the other edition.

1,734 copies published, being the "usual number" edition. Of these about 600 were issued unbound, as described above; the remainder were printed later and bound in sheep as vol. 16 of the "Miscellaneous documents of the house of representatives for the first session of the fifty-first congress."

Of some of the more important papers composing this volume brief abstracts were issued, usually "subject to revision," in advance of the volume; and of most of the papers separate copies were issued for gratuitous distribution, as follows:

SEPARATES FROM MINERAL RESOURCES 1888.

Department of the interior | United States geological survey | J. W. Powell, director | Summary | of the | mineral products | of the | United States | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 1-11. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | The | iron and steel industries of the United States | for | 1888 and 1889 | by | James M. Swank | general manager American iron and steel association | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 12-35. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Gold and silver | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

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Department of the interior | United States geological survey | J. W. Powell, director | Copper | by | C. Kirchhoff, jr. | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 43-77. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Lead | by | C. Kirchhoff, jr. | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 78-91. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Zinc | by | C. Kirchhoff, jr. | Abstract from "Mineral

resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 92-96. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director.| Quicksilver | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 97-107. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Nickel | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

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Department of the interior | United States geological survey | J. W. Powell, director | Chromium | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

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Department of the interior | United States geological survey | J. W. Powell, director | Manganese | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
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Department of the interior | United States geological survey | J. W. Powell, director | Tin | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

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Department of the interior | United States geological survey | J. W. Powell, director | Aluminum | by | R. L. Packard | Abstract from

"Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 160-164. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Platinum | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 165-167. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Coal | by | Chas. A. Ashburner | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 168-394. 8°. 500 copies.

Department of the interior | United States geological survey | J. W. Powell, director | The | manufacture of coke | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 395-441. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Petroleum | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 442-480. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Natural gas | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 481-512. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Asphaltum and Ozokerite | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 513-515. 8°. 100 copies.

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Washington | government printing office | 1890.

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 516-575. 8°. 500 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Abrasive materials | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
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Department of the interior | United States geological survey | J. W. Powell, director | Precious stones | by | George F. Kunz | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

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Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 586-596. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Salt | by | William A. Raborg | Abstract from "Mineral resources of the United States | calendar year 1888"—David T.

Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 597-612. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral paints | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 616-622. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral waters | by | A. C. Peale | Abstract from "Mineral resources of the United States | calendar year 1888"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1890

Paper cover bearing title as above; inner title same, verso blank; text, pp. 623-630. 8°. 100 copies.

MINERAL RESOURCES 1889-1890.

[Survey design] | Department of the interior | United States geological survey | J. W. Powell, director | Mineral products of the United States: | Calendar years 1880 to 1890. |
Colophon: Washington, D. C., December 28, 1891.

One sheet, 32½ by 34½ inches. A tabulation of the quantities and values of the various mineral products of the country for the years named. 4,000 copies published by the department.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral resources | of the | United States | calendar years | 1889 and 1890 | David T. Day | chief of division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Sample library catalogue slips, verso blank, 1 l.; advertisement of the publications of the survey, pp. i-v, verso "notice" concerning this series of publications; title as above, verso blank; contents, pp. iii-iv; letter of transmittal, p. v, verso blank; introduction, pp. vii-viii; summary, pp. 1-9; text, pp. 10-535, verso blank; general index to Mineral resources of the United States from 1882 to 1890, pp. 537-651, verso blank; index to the volume, pp. 653-671. 8°. One unnumbered fig. occupying p. 53, entitled "World's production of gold and silver," and one unnumbered plate facing p. 94, entitled "Production and price of quicksilver in the United States."

CONTENTS.

Page.
Summary 1-9
Iron and steel 10-47
  The iron and steel industries of the United states in 1889, 1890, and 1891, compared with the iron and steel industries of other countries, by James M. Swank 10-23
  Iron ores, by John Birkinbine 23-47

	Page.
Gold and silver, by William Kent	48-55
Copper, by C. Kirchhoff	56-77
Lead, by C. Kirchhoff	78-87
Zinc, by C. Kirchhoff	88-93
Quicksilver	94-109
Aluminum, by R. L. Packard	110-118
Tin	119-123
Nickel and cobalt	124-126
Manganese, by Joseph D. Weeks	127-136
Chromic iron ore	137-140
Antimony	141-142
Platinum	143-144
Coal, by E. W. Parker	145-286
Anthracite, by John H. Jones	242-252
Petroleum, by Joseph D. Weeks	287-365
Natural gas, by Joseph D. Weeks	366-372
Stone, by William C. Day	373-440
Pottery	441-444
Precious stones, by George F. Kunz	445-448
Fertilizers	449-455
Buhrstones	456
Corundum and emery	457
Grindstones	458
Infusorial earth	459
Oilstones, whetstones, etc	460
Cement	461-464
Product of hydraulic cement in the United States, by Spencer B. Newbury [*sic*]	461
Product of Portland cement in the United States in 1890 and 1891, by Spencer B. Newbury.	462
Gypsum	465-467
Fluorspar	468-473
Mica	474-475
Soapstone	476
Asphaltum, by E. W. Parker	477-481
Salt, by William A. Raborg	482-492
Bromine	493
Borax, by Charles G. Yale	494-506
Graphite	507
Mineral paints	508-512
Barytes	513
Asbestos	514
Sulphur	515-517
Pyrites	518
Lithographic stone	519-520
Mineral waters, by A. C. Peale	521-535
General index to mineral resources of the United States from 1882 to 1890	537-651
Index to the volume	653-671

6,000 copies published—3,000 under the law relating to survey publications and 3,000 additional copies ordered by the secretary of the interior. Sold by the director of the survey at 50 cents a copy, actual cost of publication as estimated by the public printer.

Documentary edition as follows:

52d congress, | 1st session. | House of representatives. | Mis. doc. | no. 296. | Department of the interior | United States geological survey | J. W. Powell, director | Mineral resources | of the | United States | calendar years | 1889 and 1890 | David T. Day | chief of division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

No cover; sample library catalogue slips, verso blank, 1 l.; advertisement of the publications of the survey, pp. i-v, verso "notice" concerning this series of publications; title as above, verso blank; contents and remainder of volume as described above for the other edition.

1,734 copies published, the "usual number" edition, about 600 of which were delivered unbound; the remainder were printed later and bound in sheep, in which form they constitute vol. 42 of the "Miscellaneous documents of the house of representatives for the first session of the fifty-second congress."

Of each of the papers composing this volume, except those on Soapstone and Lithographic stone and the Index from 1882 to 1890, separates were issued, for gratuitous distribution, as follows:

SEPARATES FROM MINERAL RESOURCES 1889-1890.

Department of the interior | United States geological survey | J. W. Powell, director | Summary | of the | mineral products | of the | United States | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 1-9. 8°. 100 copies.

Department of the interior | United States geological survey | J.W. Powell, director | The | iron and steel industries of the United States | for | 1889, 1890, and 1891 | by | James M. Swank | general manager American iron and steel association | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J.W. Powell, director | Iron ores | by | John Birkinbine | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J.W. Powell, director | Gold and silver | by | William Kent | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 48-55. 8°. An illustration occupies p. 53. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Copper | by | C. Kirchhoff | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J. W. Powell, director | Lead | by | C. Kirchhoff | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J. W. Powell, director | Zinc | by | C. Kirchhoff | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 88-93. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Quicksilver | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 94-109. 8°. The copy of this separate which I have seen lacks the plate facing p. 94 in the volume. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Aluminum | by | R. L. Packard | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J. W. Powell, director | Tin | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 119-123. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Nickel and cobalt | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
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Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 124-126. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Manganese | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J. W. Powell, director | Chromic iron ore, antimony, and platinum | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
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Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 145-286 8°. 1,500 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Petroleum | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar years 1889 and

1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J. W. Powell, director | Natural gas | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 366-372. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Stone | by | William C. Day | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 373-440. 8°. 1,500 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Pottery | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 441-444. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Precious stones | by | George F. Kunz | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 445-448. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Fertilizers | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 449-455. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Abrasive materials | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 456-460. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Cement and gypsum | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 461-467. 8°. 100 copies.

Department of the interior | United States geological survey | J.W. Powell, director | Fluorspar | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 468-473. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Mica | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 474-475. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Asphaltum | by | E. W. Parker | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

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Department of the interior | United States geological survey | J. W. Powell, director | Salt | by | William A. Raborg | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—

David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 482-492. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Bromine and borax | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 493-506. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Graphite, mineral paints, barytes | and asbestos | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 507-514. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Sulphur and pyrites | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 515-518. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral waters | by | A. C. Peale | Abstract from "Mineral resources of the United States | calendar years 1889 and 1890"—David T. Day, chief of | the division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title same, verso blank; text, pp. 521-535. 8°. 400 copies.

MINERAL RESOURCES 1891.

[Survey design] Department of the interior | United States geological survey | J. W. Powell, director. | Mineral products of the United States. | Calendar years 1880 to 1891.

Colophon: Washington, D. C., October 1, 1892. | David T. Day, | chief of division of mining statistics.

One sheet, 28 by 31 inches. A tabulation of the quantities and values of the various mineral products of the country for the years named. 4,000 copies issued by the department.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral resources | of the | United States | calendar year | 1891 | David T. Day | chief of division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Sample library catalogue slips, verso blank, 1 l.; advertisement of the publications of the survey, pp. i–v, verso notice; title as above, verso blank; contents, pp. iii–iv; letter of transmittal to the director, p. v, verso blank; introduction, p. vii, verso blank; text, pp. 1–610; index, pp. 611–630. 8°. Three unnumbered illustrations, one occupying pp. 44–45, one (a folded plate) following p. 46, and one occupying p. 118.

CONTENTS.

	Page.
Summary	1–9
Iron ores, by John Birkinbine	10–46
Twenty years of progress in the manufacture of iron and steel in the United States, by James M. Swank	47–73
Gold and silver	74–80
Copper, by C. Kirchhoff	81–102
Lead, by C. Kirchhoff	103–110
Zinc, by C. Kirchhoff	111–116
Quicksilver	117–125
Manganese, by Joseph D. Weeks	126–146
Aluminum, by R. L. Packard	147–163
Tin	164–166
Nickel and cobalt	167–170
Chrome iron ore	171–173
Antimony, by E. W. Parker	174–176
Coal, by E. W. Parker	177–356
Manufacture of coke, by Joseph D. Weeks	357–402
Petroleum, by Joseph D. Weeks	403–435
Natural gas, by Joseph D. Weeks	436–457
Asphaltum, by E. W. Parker	452–455
Stone, by Wm. C. Day	456–473
Granite	456–460
Sandstone	460–463
Limestone	464–468
Marble	468–471
Slate	472–473
Clay materials of the United States, by Robert T. Hill	474–528
Natural and artificial cements, by Spencer B. Newberry [*sic*]	529–538
Precious stones, by George F. Kunz	539–551
Abrasive materials, by E. W. Parker	552–556
Buhrstones	552
Grindstones	552–553
Oilstones and whetstones	553–555
Emery and corundum	555–556
Fertilizers	557–563
Sulphur, by E. W. Parker	564–571
Salt	572–578
Bromine	579
Gypsum, by E. W. Parker	580–583
Magnesite	584–585
Fluorspar	586
Borax	587–588
Graphite, by E. W. Parker	589–590
Asbestos, by E. W. Parker	591–592

	Page.
Soapstone, by E. W. Parker	593-594
Mineral paints, by E. W. Parker	595-598
Barytes	599-600
Mineral waters, by A. C. Peale	601-610
Index	611-630

7,000 copies published—3,000 under the law relating to survey publications and 4,000 additional copies ordered by the secretary of the interior. Sold by the director of the survey at 50 cents a copy, actual cost of publication as estimated by the public printer.

At this writing the documentary edition of M. R. 1891 has not been issued.

Of the papers composing this volume separates were issued as follows:

SEPARATES FROM MINERAL RESOURCES 1891.

Department of the interior | United States geological survey | J. W. Powell, director | The | production of iron ores | in | 1891 | by | John Birkinbine | Extract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp 10-46. 8°. 2 plates. 100 copies.

The foregoing is the regular separate, delivered in May, 1893; but there was an issue of 700 copies in advance of the volume; in these the title is identical with that given above except that the date is 1892 instead of 1893, and the collation is the same except that the text is repaged 3-37 and the running heading on both even and odd pages is made to read "Production of iron ores in 1891."

Department of the interior | United States geological survey | J. W. Powell, director | Twenty years of progress | in the | manufacture of iron and steel | in the | United States | by | James M. Swank | general manager American iron and steel association | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp 47-73. 8°. 100 copies.

The foregoing is the regular separate from the volume, but the same matter was printed and issued earlier, as follows:

Department of the interior, | United States geological survey. | J. W. Powell, director. | Twenty years of progress | in | the manufacture of iron and steel | in the United States. | By | James M. Swank, | general manager of the American iron and steel association. | Extract from Mineral resources of the United States | for calendar year 1891.—David T. Day, chief of the | division of mining statistics and technology. | [Survey design.] |
Washington: | 1892.

Paper cover bearing title as above, verso contents; no inner title; text, pp. 1-32. 8°. 600 copies. At the foot of p. 31 is the following line: "No. 261 South Fourth

Street, Philadelphia, December 1, 1892." This brochure was printed in Philadelphia in advance of the volume, the former being used as copy for the corresponding portion of the latter, though there are a few minor differences between the two texts, probably made in proof. Moreover, the last page of this earlier brochure is occupied by a "Comparative exhibit of the foregoing statistical statements," partly in graphic form, which does not appear at all in the volume or the regular separate.

Twenty years of iron-ore development, pp. 1-7.
Twenty years of pig-iron production, pp. 7-13.
Twenty years of progress in the manufacture of steel, pp. 13-16.
Twenty years of rolling-mill development, pp. 17-19.
Twenty years of changes in the manufacture of iron and steel rails, pp. 19-22.
Twenty years of progress in the manufacture of nails, pp. 23-24.
Twenty years of progress in iron and steel bridge-building, pp. 24-25.
Twenty years of iron and steel shipbuilding, pp. 25-27.
Efforts to establish the tin-plate industry, pp. 27-29.
A branch of the iron industry which has declined, p. 29.
Twenty years of prices of iron and steel, p. 30.
The United States now the first of all iron and steel manufacturing countries, pp. 30-31.
Comparative exhibit of the foregoing statistical statements, p. 32.

Department of the interior | United States geological survey | J. W. Powell, director | Gold and silver | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 74-80. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Copper | by | C. Kirchhoff | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 81-102. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Lead | by | C. Kirchhoff | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 103-110. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Zinc | by | C. Kirchhoff | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 111-116. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Quicksilver | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 117-125 (p. 118 being occupied by an unnumbered plate). 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Manganese | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 126-146. 8°. 200 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Aluminum | by | R. L. Packard | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 147-63. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Tin | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 164-166. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Nickel and cobalt | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 167-170. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Chrome iron ore | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 171-173. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Antimony | by | E. W. Parker | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 174–176. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Coal | by | E. W. Parker | Extract [*sic*] from "Mineral resources of the United States," [*sic*] | calendar year 1891—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above, inner title the same, verso blank; text, pp. 3–182. 8°. 2,600 copies; issued in advance of the volume. The text is identical with the corresponding text in the volume; only the pagination and running headings changed.

Department of the interior | United States geological survey | J. W. Powell, director. | The | manufacture of coke | by | Joseph D. Weeks | Extract [*sic*] from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1892

Paper cover bearing title as above; inner title the same, verso blank; text, pp. 3–48. 8°. 600 copies; issued in advance of the volume. The text is identical with the corresponding text in the volume; only the pagination and running headings changed.

Department of the interior | United States geological survey | J. W. Powell, director | Petroleum | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 403–435. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Natural gas | by | Joseph D. Weeks | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 436–451. 8°. 800 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Asphaltum | by | E. W. Parker | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 452-455. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Stone | by | William C. Day | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 456-473. 8°. 1,500 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Clay materials of the United States | by | Robert T. Hill | Abstract from "Mineral resources of the United States | calendar year 1891"—Division of mining | statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 474-528. 8°. 300 copies. The words "David T. Day, chief of the," usually found in the titles of these separates, are lacking in this instance.

Department of the interior | United States geological survey | J. W. Powell, director | Natural and artificial cements | by | Spencer B. Newberry [*sic*] | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 529-538. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Precious stones | by | George F. Kunz | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 539-551. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Abrasive materials | by | E. W. Parker | Abstract

from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 552–556. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Fertilizers | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 557–563. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Sulphur | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 564–571. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Salt and bromine | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 572–579. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Gypsum | by | E. W. Parker | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 580–583. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Magnesite | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 584–585. 8°. 100 copies.

Department of the interior | United States geological survey | Fluorspar and borax | Abstract from "Mineral resources of the United

States | calendar year 1891"—Division of mining | statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso beginning of text; text, pp. 586–588. 8°. 100 copies. The words "David T. Day, chief of the," usually found in the titles of these separates, are lacking in this instance.

Department of the interior | United States geological survey | J. W. Powell, director | Graphite, asbestos, and soapstone | by | E. W. Parker | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 589–594. 8°. 200 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral paints and barytes | by | E. W. Parker | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 595–600. 8°. 100 copies.

Department of the interior | United States geological survey | J. W. Powell, director | Mineral waters | by | A. C. Peale | Abstract from "Mineral resources of the United States | calendar year 1891"—David T. Day, chief of the | division of mining statistics and technology | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; text, pp. 601–610. 8°. 100 copies.

GEOLOGIC ATLAS OF THE UNITED STATES AND AUXILIARY AND SUBSIDIARY MAPS.

GEOLOGIC FOLIOS.

Department of the interior | United States geological survey | J. W. Powell, director | Geologic atlas | of the | United States | Chattanooga sheet | Tennessee [-Ringgold sheet | Tennessee-Georgia] | Index map | [the index map, showing geographic position of area covered by the sheet] | Scale: 50 miles=1 inch | List of sheets | explanatory Appalachian descriptive topography areal geology structure sections | economic geology columnar sections |

Executed by the engraving division, U. S. geological survey | Washington, D. C. | 1892 | Chattanooga sheet [-Ringgold sheet]

Title as above on cover, laid loosely inside which are, in each case, the sheets composing the folio.

The following information concerning these atlas folios is taken from the explanatory text which accompanies every folio:

"The Geological Survey is making a large topographic map and a large geologic map of the United States. These large maps are being made in small sections or sheets of convenient and uniform size. Several thousand such sheets are required for the whole of the United States. Taken altogether they will constitute an atlas, and each leaf is called an atlas sheet. . . . . .

"Three different scales are used on the atlas sheets of the U. S. Geological Survey; the smallest is $\frac{1}{250000}$, the second $\frac{1}{125000}$, and the largest $\frac{1}{62500}$. These correspond approximately to four miles, two miles, and one mile of natural length to one inch of map length. . . . . .

"A map of the United States on the smallest scale used by the U. S. Geological Survey would be 60 feet long and 45 feet high. If drawn on one of the larger scales it would be either two times or four times as long and high. To make it possible to use such a map it is divided into parts printed on atlas sheets of convenient size, about 17 by 21 inches, and bounded by parallels and meridians. Each sheet on the scale of $\frac{1}{250000}$ contains one square degree (that is, represents an area one degree in extent in each direction); each sheet on the scale of $\frac{1}{125000}$ contains one-quarter of a square degree; each sheet on the scale of $\frac{1}{62500}$, one-sixteenth of a square degree. These areas correspond nearly to 4,000, 1,000, and 250 square miles.

"The atlas sheets, being parts of one great map, are laid out without reference to political boundary lines of any kind. They are not state, county, or town maps, but only parts of one map of the United States. For convenience of reference they are given such names as will readily suggest the region shown. . . . . .

"The details belonging to the geologic map are numerous, and in some districts a single sheet does not suffice for their representation without confusion. In such cases special groups of facts are represented on different copies of the same base map. In many of the northern states the Pleistocene formations are varied in character and require representation in detail, yet fail to conceal wholly the underlying formations, so that the latter also can be mapped. In such case a special sheet is devoted to the Pleistocene formations. In regions where the rocks are greatly folded it is specially important that record be made of their inclination or dip. To this end structure sections are delineated on a sheet, which is a partial duplicate of the general geologic map, so as to bring them into close relation to the representation of formation areas, and there is added a special notation to indicate the direction and amount of dip. In certain districts where economic resources are sufficiently important, a special sheet is devoted to the representation of mines and minerals in their relation to the rock formations."

At this writing the following six folios have been finished, but there is yet no edition for distribution, though it is hoped one will soon be ready.

Folio.	*Sheets.*
Chattanooga, Tenn	Explanatory. Appalachian. Descriptive. Topography. Areal geology. Structure sections. Economic geology. Columnar sections.
Hawley, Mass	Explanatory. Green Mountain. Descriptive. Topography. Areal geology. Economic geology. Structure sections.
Sacramento, Cal	Explanatory. Sketch of Gold Belt. Descriptive text. Topography. Areal geology. Economic geology. Structure sections.
Lassen Peak, Cal	Explanatory. Descriptive. Topography. Areal geology. Economic geology. Illustrations of the Cinder Cone.
Kingston, Tenn	Explanatory. Appalachian. Descriptive. Topography. Areal geology. Economic geology. Structure sections. Columnar sections.
Ringgold, Tenn.-Ga	Explanatory. Appalachian. Descriptive. Topography. Areal geology. Economic geology. Structure sections. Columnar sections.

Special geologic sheets and maps accompany many of the volumes of text; see entries under "Maps, geologic" in the index, pp. 410-416 of this bulletin.

TOPOGRAPHIC ATLAS SHEETS.

pography is the basis of geologic representation, and as no suitable topographic of the country existed, the preparation of such a map claimed the first atten- of the survey. The topographic work is therefore well advanced, the follow- atlas sheets having been finished. The plates are ready for the press, but no on for general distribution has been printed, and the survey is therefore sup- l with only a limited number of proofs.

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			Feet.
	Portland	43	30	70	15	$\frac{1}{16}$ degree	1:62500	20
	Newfield	43	30	70	45	...do	...do	20
	Biddeford	43	15	70	15	...do	...do	20
	Kennebunk	43	15	70	30	...do	...do	20
	Gardiner	44	00	69	45	...do	...do	20
	Freeport	43	45	70	00	...do	...do	20
	Augusta	44	15	69	45	...do	...do	20
	Buxton	43	30	70	30	...do	...do	20
	Waterville	44	30	69	30	...do	...do	20
	Small Point	43	30	69	45	...do	...do	20
	Boothbay	43	45	69	30	...do	...do	20
	Bath	43	45	69	45	...do	...do	20
	Wiscasset	44	00	69	30	...do	...do	20
	Vassalboro	44	15	69	30	...do	...do	20
	Norridgewock	44	30	69	45	...do	...do	20
and New Hamp-	York	43	00	70	30	...do	...do	20
	Dover	43	00	70	45	...do	...do	20
	Berwick	43	15	70	45	...do	...do	20
ampshire	Mount Washington	44	15	71	15	...do	...do	20
ampshire and Ver-	Brattleboro	42	45	72	30	...do	...do	20
nt	Wilmington	42	45	72	45	...do	...do	20
	Rutland	43	30	72	45	...do	...do	20
	Wallingford	43	15	72	45	...do	...do	20
husetts and New pshire.	Newburyport	42	45	70	45	...do	...do	20
	Haverhill	42	45	71	00	...do	...do	20
	Lawrence	42	30	71	00	...do	...do	20
	Lowell	42	30	71	15	...do	...do	20
	Groton	42	30	71	30	...do	...do	20
	Fitchburg	42	30	71	45	...do	...do	20
	Winchendon	42	00	72	00	...do	...do	20
chusetts, New pshire, and Ver-	Warwick	42	30	72	15	...do	...do	20
husetts and Ver-	Greenfield	42	30	72	30	...do	...do	20
	Hawley	42	30	72	45	...do	...do	20
	Greylock	42	30	73	00	...do	...do	40
husetts, Vermont, ew York.	Berlin	42	30	73	15	...do	...do	20
husetts and New	Pittsfield	42	15	73	15	...do	...do	20
husetts	Gloucester	42	30	70	30	...do	...do	20
	Salem	42	30	70	45	...do	...do	20
	Boston Bay	42	15	70	45	...do	...do	20
	Boston	42	15	71	00	...do	...do	20

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			*Feet.*
Massachusetts	Framingham	42	15	71	15	$\frac{1}{16}$ degree	1:62500	20
	Marlboro	42	15	71	30	...do ...	...do ...	20
	Worcester	42	15	71	45	...do ...	...do ...	20
	Barre	42	15	72	00	...do ...	...do ...	20
	Belchertown	42	15	72	15	...do ...	...do ...	20
	Northampton	42	15	72	30	...do ...	...do ...	20
	Chesterfield	42	15	72	45	...do ...	...do ...	20
	Becket	42	15	73	00	...do ...	...do ...	20
	Provincetown	42	00	70	00	...do ...	...do ...	20
	Duxbury	42	00	70	30	...do ...	...do ...	20
	Abington	42	00	70	45	...do ...	...do ...	20
	Dedham	42	00	71	00	...do ...	...do ...	20
	Wellfleet	41	45	69	55	...do ...	...do ...	20
	Plymouth	41	45	70	30	...do ...	...do ...	20
	Middleboro	41	45	70	45	...do ...	...do ...	20
	Taunton	41	45	71	00	...do ...	...do ...	20
	Chatham	41	30	69	45	...do ...	...do ...	20
	Yarmouth	41	30	70	00	...do ...	...do ...	20
	Barnstable	41	32	70	15	...do ...	...do ...	20
	Falmouth	41	30	70	30	...do ...	...do ...	20
	New Bedford	41	30	70	45	...do ...	...do ...	20
	Nantucket	41	13	69	57	...do ...	...do ...	20
	Muskeget	41	15	70	12	...do ...	...do ...	20
	Marthas Vineyard	41	15	70	27	...do ...	...do ...	20
	Gay Head	41	15	70	42	...do ...	...do ...	20
Massachusetts and Connecticut.	Webster	42	00	71	45	...do ...	...do ...	20
	Brookfield	42	00	72	00	...do ...	...do ...	20
	Palmer	42	00	72	15	...do ...	...do ...	20
	Springfield	42	00	72	30	...do ...	...do ...	20
	Granville	42	00	72	45	...do ...	...do ...	20
	Sandisfield	42	00	73	00	...do ...	...do ...	20
Massachusetts, Connecticut, and New York.	Sheffield	42	00	73	15	...do ...	...do ...	20
Massachusetts and Rhode Island.	Franklin	42	00	71	15	...do ...	...do ...	20
	Blackstone	42	00	71	30	...do ...	...do ...	20
	Providence	41	45	71	15	...do ...	...do ...	20
	Fall River	41	30	71	00	...do ...	...do ...	20
Rhode Island	Burrilville	41	45	71	30	...do ...	...do ...	20
	Narragansett Bay	41	30	71	15	...do ...	...do ...	20
	Kent	41	30	71	30	...do ...	...do ...	20
	Sakonnet	41	15	71	00	...do ...	...do ...	20
Rhode Island	Newport	41	15	71	15	...do ...	...do ...	20
	Charlestown	41	15	71	30	...do ...	...do ...	20
	Block Island	41	00	71	30	...do ...	...do ...	20
Rhode Island and Connecticut.	Putnam	41	45	71	45	...do ...	...do ...	20
	Moosup	41	30	71	45	...do ...	...do ...	20
Rhode Island, Connecticut, and New York.	Stonington	41	15	71	45	...do ...	...do ...	20
Connecticut	Meriden	41	30	72	45	...do ...	...do ...	20
	Waterbury	41	30	73	00	...do ...	...do ...	20
	New Milford	41	30	73	15	...do ...	...do ...	20
	New Haven	41	15	72	45	...do ...	...do ...	20
	Derby	41	15	73	00	...do ...	...do ...	20

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			Feet.
Connecticut	Bridgeport	41	00	73	00	$\frac{1}{16}$ degree	1:62500	20
	Norwalk	41	00	73	15	do	do	20
	Danbury	41	15	73	15	do	do	20
	Winsted	41	45	73	00	do	do	20
	New London	41	15	72	00	do	do	20
	Tolland	41	45	72	15	do	do	20
	Hartford	41	45	72	30	do	do	20
	Granby	41	45	72	45	do	do	20
	Saybrook	41	15	72	15	do	do	20
	Guilford	41	15	72	30	do	do	20
	Woodstock	41	45	72	00	do	do	20
	Gilead	41	30	72	15	do	do	20
	Middletown	41	30	72	30	do	do	20
	Norwich	41	30	72	00	do	do	20
New York and Connecticut.	Stamford	41	00	73	30	do	do	20
New York	Albany	42	30	73	45	do	do	20
	West Point	41	15	73	45	do	do	20
	Brooklyn	40	30	73	45	do	do	20
	Carmel	41	15	73	30	do	do	20
	Clove	41	30	73	30	do	do	20
	Troy	42	30	73	30	do	do	20
New York and New Jersey.	Harlem	40	45	73	45	do	do	20
	Staten Island	40	30	74	00	do	do	20
	Ramapo	41	00	74	00	do	do	20
	Greenwood lake	41	00	74	15	do	do	20
	Tarrytown	41	00	73	45	do	do	20
New Jersey	Franklin	41	00	74	30	do	do	20
	Paterson	41	00	74	00	do	do	20
	Morristown	40	45	74	15	do	do	20
	Lake Hopatcong	40	45	74	30	do	do	20
	Hackettstown	40	45	74	45	do	do	20
	Plainfield	40	30	74	15	do	do	20
	Somerville	40	30	74	30	do	do	20
	High Bridge	40	30	74	45	do	do	20
	Sandy Hook	40	15	74	00	do	do	10
	New Brunswick	40	15	74	15	do	do	10
	Princeton	40	15	74	30	do	do	10
	Asbury Park	40	00	74	00	do	do	10
	Cassville	40	00	74	15	do	do	10
	Bordentown	40	00	74	30	do	do	10
	Barnegat	39	45	74	00	do	do	10
	Whitings	39	45	74	15	do	do	10
	Pemberton	39	45	74	30	do	do	10
	Mount Holly	39	45	74	45	do	do	10
	Long Beach	39	30	74	00	do	do	10
	Little Egg Harbor	39	30	74	15	do	do	10
	Mullicas	39	30	74	30	do	do	10
	Hammonton	39	30	74	45	do	do	10
	Glassboro	39	30	75	00	do	do	10
	Salem	39	30	75	15	do	do	10
	Atlantic City	39	15	74	15	do	do	10

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			*Feet.*
New Jersey	Great Egg Harbor	39	15	74	30	1/16 degree	1:62500	10
	Tuckahoe	39	15	74	45	do	do	10
	Bridgeton	39	15	75	00	do	do	10
	Sea Isle	39	00	74	30	do	do	10
	Dennisville	39	00	74	45	do	do	10
	Maurice Cove	39	00	75	00	do	do	10
	Cape May	38	45	74	45	do	do	10
New Jersey and Pennsylvania.	Wallpack	41	00	74	45	do	do	20
	Delaware Water Gap	40	45	75	00	do	do	20
	Easton	40	30	75	00	do	do	20
	Lambertville	40	15	74	45	do	do	20
	Burlington	40	00	74	45	do	do	20
	Philadelphia	39	45	75	00	do	do	20
Pennsylvania	Scranton	41	15	75	30	do	do	20
	Hazelton	40	45	75	45	do	do	20
	Catawissa	40	45	76	15	do	do	20
	Lykens	40	30	76	30	do	do	20
	Doylestown	40	15	75	00	do	do	20
	Quakertown	40	15	75	15	do	do	20
	Lebanon	40	15	76	15	do	do	20
	Germantown	40	00	75	00	do	do	20
	Shamokin	40	45	76	30	do	do	20
	Pottsville	40	30	76	00	do	do	20
	Dundaff	41	30	75	30	do	do	20
	Honesdale	41	30	75	15	do	do	20
	Harrisburg	40	15	76	45	do	do	20
	Hummelstown	40	15	76	30	do	do	20
	Pittston	41	15	75	45	do	do	20
New Jersey and Delaware	Bayside	39	15	75	15	do	do	10
Maryland	Baltimore	39	15	76	30	do	do	20
	Brandywine	38	30	76	45	do	do	20
	Annapolis	38	45	76	15	do	do	20
	Wicomico	38	15	76	30	do	do	20
	Owensville	38	45	76	30	do	do	20
	Relay	39	00	76	30	do	do	20
	Ellicott	39	15	76	45	do	do	20
	Drum Point	38	15	76	15	do	do	20
	Prince Fredericktown	38	30	76	30	do	do	20
	Laurel	39	00	76	45	do	do	20
	Leonardtown	38	15	76	30	do	do	20
	Sharps Island	38	30	76	15	do	do	20
	North Point	39	00	76	15	do	do	20
	Gunpowder	39	15	76	15	do	do	20
Maryland and District of Columbia	East Washington	38	45	76	45	do	do	20
Maryland, District of Columbia, and Virginia.	West Washington	38	45	77	00	do	do	20
	Mount Vernon	38	30	77	00	¼ degree.	1:125000	50
Maryland, Virginia, and West Virginia.	Harpers Ferry	39	00	77	30	do	do	100
	Romney	39	00	78	30	do	do	100
Maryland and West Virginia.	Piedmont	39	00	79	00	do	do	100
Maryland and Virginia	Frederick	39	00	77	00	do	do	50
	Fredericksburg	38	00	77	00	do	do	50

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	'	°	'			Feet.
yland and Virginia..	Point Lookout	38	00	76	15	1/16 degree	1:62500	20
	Piney Point	38	00	76	30	...do	....do	20
	Montross	38	00	76	45	...do	....do	20
inia	Warrenton	38	30	77	30	¼ degree.	1:125000	50
	Luray	38	30	78	00	...do	....do	100
	Spottsylvania	38	00	77	30	...do	....do	50
	Gordonsville	38	00	78	00	...do	....do	100
	Harrisonburg	38	00	78	00	...do	....do	100
	Goochland	37	30	77	30	...do	....do	50
	Palmyra	37	30	78	00	...do	....do	50
	Buckingham	37	30	78	30	...do	....do	100
	Lexington	37	30	79	00	...do	....do	100
	Natural Bridge	37	30	79	30	...do	....do	100
	Farmville	37	00	78	00	...do	....do	50
	Roanoke	37	00	79	30	...do	....do	100
	Appomattox	37	00	78	30	...do	....do	50
	Lynchburg	37	00	79	00	...do	....do	100
	Virginia Beach	36	30	75	30	...do	....do	5
	Norfolk	36	30	76	00	...do	....do	5
inia and] West Vir- ia.	Winchester	39	00	78	00	...do	....do	100
	Woodstock	38	30	78	30	...do	....do	100
	Franklin	38	30	79	00	...do	....do	100
	Beverly	38	30	79	30	...do	....do	100
	Staunton	38	00	79	00	...do	....do	100
	Monterey	38	00	79	30	...do	....do	100
	Lewisburg	37	30	80	00	...do	....do	100
	Christiansburg	37	00	80	00	...do	....do	100
	Dublin	37	00	80	30	...do	....do	100
	Pocahontas	37	00	81	00	...do	....do	100
	Tazewell	37	00	81	30	...do	....do	100
Virginia	St. George	39	00	79	30	...do	....do	100
	Huntersville	38	00	80	00	...do	....do	100
	Nicholas	38	00	80	30	...do	....do	100
	Kanawha Falls	38	00	81	00	...do	....do	100
	Hinton	37	30	80	30	...do	....do	100
	Raleigh	37	30	81	00	...do	....do	100
	Oceana	37	80	81	30	...do	....do	100
	Charleston	38	00	81	30	...do	....do	100
	Buckhannon	38	80	80	00	...do	....do	100
	Sutton	38	30	80	30	...do	....do	100
Virginia and Ohio.	Huntington	38	00	82	00	...do	....do	100
Virginia, Virginia, Kentucky.	Warfield	37	30	82	00	...do	....do	100
ucky	Prestonburg	37	30	82	30	...do	....do	100
	Salyersville	37	30	83	00	...do	....do	100
	Hazard	37	00	83	00	...do	....do	100
	Manchester	37	00	83	30	...do	....do	100
	Beattyville	37	30	83	80	...do	....do	100
	Richmond	37	30	84	00	...do	....do	100
	London	37	00	84	00	...do	....do	100
ucky and Virginia..	Whitesburg	37	00	82	30	...do	....do	100
	Grundy	37	00	82	00	...do	....do	100

Locality.	Name of sheet.	Designation of sheet.		Area covered.	Scale.	Contour interval.
		Lat.	Long.			
		° ′	° ′			Feet.
Virginia and North Carolina.	Hillsville	36 30	80 30	¼ degree.	1:125000	100
	Wytheville	36 30	81 00	...do	...do	100
Virginia, North Carolina, and Tennessee.	Abingdon	36 30	81 30	...do	...do	100
Virginia and Tennessee	Bristol	36 30	82 00	...do	...do	100
Kentucky, Virginia, and Tennessee.	Estillville	36 30	82 30	...do	...do	100
	Jonesville	36 30	83 00	...do	...do	100
	Cumberland Gap	36 30	83 30	...do	...do	100
Kentucky and Tennessee	Williamsburg	36 30	84 00	...do	...do	100
	Wilkesboro	36 00	81 00	...do	...do	100
North Carolina	Morganton	35 30	81 30	...do	...do	100
	Cowee	35 00	83 00	...do	...do	100
	Statesville	35 30	80 30	...do	...do	50
North Carolina and Tennessee.	Roan Mountain	36 00	82 00	...do	...do	100
	Cranberry	36 00	81 30	...do	...do	100
	Greenville	36 00	82 30	...do	...do	100
	Mount Mitchell	35 30	82 00	...do	...do	100
	Asheville	35 30	82 30	...do	...do	100
	Mount Guyot	35 30	83 00	...do	...do	100
	Knoxville	35 30	83 30	...do	...do	100
	Nantahalah	35 00	83 30	...do	...do	100
	Murphy	35 00	84 00	...do	...do	100
North Carolina and South Carolina.	Saluda	35 00	82 00	...do	...do	100
	Pisgah	35 00	82 30	...do	...do	100
Tennessee	Morristown	36 00	83 00	...do	...do	100
	Maynardville	36 00	83 30	...do	...do	100
	Loudon	35 30	84 00	...do	...do	100
	Kingston	35 30	84 30	...do	...do	100
	Cleveland	35 00	84 30	...do	...do	100
	Chattanooga	35 00	85 00	...do	...do	100
	Pikeville	35 30	85 00	...do	...do	100
	Sewanee	35 00	85 30	...do	...do	100
	McMinnville	35 30	85 30	...do	...do	100
	Briceville	36 00	84 00	...do	...do	100
South Carolina	Pickens	34 30	82 30	...do	...do	100
	Abbeville	34 00	82 00	...do	...do	50
South Carolina and Georgia.	Walhalla	34 30	83 00	...do	...do	50
	Elberton	34 00	82 30	...do	...do	100
	McCormick	33 30	82 00	...do	...do	50
Georgia	Dahlonega	34 30	83 30	...do	...do	100
	Ellijay	34 30	84 00	...do	...do	100
	Dalton	34 30	84 30	...do	...do	100
	Carnesville	34 00	83 00	...do	...do	100
	Gainesville	34 00	83 30	...do	...do	100
	Suwanee	34 00	84 00	...do	...do	100
	Cartersville	34 00	84 30	...do	...do	100
	Atlanta	33 30	84 00	...do	...do	100
	Marietta	33 30	84 30	...do	...do	50
Georgia and Alabama	Ringgold	34 30	85 00	...do	...do	100
	Rome	34 00	85 00	...do	...do	100
	Tallapoosa	33 30	85 00	...do	...do	100
Alabama	Stevenson	34 30	85 30	...do	...do	100
	Scottsboro	34 30	86 00	...do	...do	100
	Huntsville	34 30	86 30	...do	...do	100

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			*Feet.*
bama	Fort Payne	34	00	85	30	¼ degree.	1:125000	100
	Gadsden	34	00	86	00	...do	....do	100
	Cullman	34	00	86	30	...do	....do	100
	Anniston	33	30	85	30	...do	....do	100
	Springville	33	30	86	00	...do	....do	100
	Birmingham	33	30	86	30	...do	....do	100
	Ashland	33	00	85	30	...do	....do	100
	Talladega	33	00	86	00	...do	....do	100
	Bessemer	33	00	86	30	...do	....do	100
	Clanton	32	30	86	30	...do	....do	50
isiana	Bonnett Carre	30	00	90	15	1/16 degree	1:62500	5
	Spanish Fort	30	00	90	00	...do	....do	None.
	New Orleans	29	45	90	00	...do	....do	5
	Lac des Allemands	29	45	90	30	...do	....do	5
	St. Bernard	29	45	89	45	...do	....do	5
	Hahnville	29	45	90	15	...do	....do	5
	Thibodeaux	29	45	90	45	...do	....do	5
	Pointe à la Hache	29	30	89	45	...do	....do	5
	Quarantine	29	15	89	30	...do	....do	5
	Barataria	29	30	90	00	...do	....do	5
	Fort Livingstone	29	15	89	45	...do	....do	None.
	Chef Mentour	30	00	89	45	...do	....do	None.
	Cut Off	29	30	90	15	...do	....do	5
	Cheniere Caminada	29	00	90	00	...do	....do	None.
	Houma	29	30	90	30	...do	....do	5
	Mount Airy	30	00	90	30	...do	....do	5
	Donaldsonville	30	00	90	45	...do	....do	5
	West Delta	29	00	89	15	...do	....do	None.
	Creole	29	15	90	00	...do	....do	None.
	Gibson	29	30	90	45	...do	....do	5
	East Delta	29	00	89	00	...do	....do	5
	Forts	29	15	89	15	...do	....do	5
	La Fortnna	29	30	89	15	...do	....do	5
	Shell Beach	29	45	89	30	...do	....do	5
	Cat Island	30	00	89	00	...do	....do	5
	Toulme	30	00	89	15	...do	....do	5
	Rigolets	30	00	89	30	...do	....do	5
la	Dunellon	29	00	82	15	...do	....do	10
	Arredondo	29	30	82	15	...do	....do	10
nsin	Sun Prairie	43	00	89	00	...do	....do	20
	Waterloo	43	00	88	45	...do	....do	20
	Madison	43	00	89	15	...do	....do	20
	Koshkonong	42	45	88	45	...do	....do	20
	Stoughton	42	45	89	00	...do	....do	20
	Evansville	42	45	89	15	...do	....do	20
	Whitewater	42	45	88	30	...do	....do	20
	Eagle	42	45	88	15	.. do	....do	20
	Watertown	43	00	88	30	...do	....do	20
	Port Washington	43	15	87	45	...do	....do	20
	Bayview	42	45	87	45	...do	....do	20
	Racine	42	30	87	45	...do	....do	20
	Oconomowoc	43	00	88	15	...do	....do	20
	Waukesha	43	00	88	00	...do	....do	20

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	'	°	'			*Feet.*
Wisconsin	Milwaukee	43	00	87	45	$\frac{1}{16}$ degree	1:62500	20
	Muskego	42	45	88	00	do	do	20
Illinois	Desplaines	41	45	87	45	do	do	10
	Riverside	41	30	87	45	do	do	10
	Joliet	41	30	88	00	do	do	10
	Wilmington	41	15	88	00	do	do	10
	Morris	41	15	88	15	do	do	10
	Marseilles	41	15	88	30	do	do	10
	Ottawa	41	15	88	45	do	do	10
	Chicago	41	45	87	30	do	do	5
	Lacon	41	00	89	15	do	do	10
	Lasalle	41	15	89	00	do	do	10
	Hennepin	41	15	89	15	do	do	10
Illinois and Indiana	Calumet	41	30	87	30	do	do	10
Iowa	Maquoketa	42	00	90	30	do	do	20
	Baldwin	42	00	90	45	do	do	20
	Monticello	42	00	91	00	do	do	20
	Anamosa	42	00	91	15	do	do	20
	Marion	42	00	91	30	do	do	20
	Shellsburg	42	00	91	45	do	do	20
	DeWitt	41	45	90	30	do	do	20
	Wheatland	41	45	90	45	do	do	20
	Tipton	41	45	91	00	do	do	20
	Mechanicsville	41	45	91	15	do	do	20
	Cedar Rapids	41	45	91	30	do	do	20
	Amana	41	45	91	45	do	do	20
	West Liberty	41	30	91	15	do	do	20
	Iowa City	41	30	91	30	do	do	20
	Oxford	41	30	91	45	do	do	20
	Davenport	41	30	90	30	do	do	20
	Durant	40	30	90	45	do	do	20
	Wilton Junction	41	30	91	00	do	do	20
Iowa and Illinois	Clinton	41	45	90	00	do	do	20
	Goose Lake	41	45	90	15	do	do	20
	Leclaire	41	30	90	15	do	do	20
	Savanna	42	00	90	00	do	do	20
Missouri and Illinois	Louisiana	39	00	91	00	$\frac{1}{4}$ degree.	1:125000	50
	St. Louis, East	38	30	90	00	$\frac{1}{16}$ degree	1:62500	20
Missouri	St. Louis, West	38	30	90	15	do	do	20
	Mexico	39	00	91	30	$\frac{1}{4}$ degree.	1:125000	50
	Moberly	39	00	92	00	do	do	50
	Glasgow	39	00	92	30	do	do	50
	Marshall	39	00	93	00	do	do	50
	Lexington	39	00	93	30	do	do	50
	Independence	39	00	94	00	do	do	50
	Hermann	38	30	91	00	do	do	50
	Fulton	38	30	91	30	do	do	50
	Jefferson City	38	30	92	00	do	do	50
	Boonville	38	30	92	30	do	do	50
	Sedalia	38	30	93	00	do	do	50
	Warrensburg	38	30	93	30	do	do	50
	Harrisonville	38	30	94	00	do	do	50
	Tuscumbia	38	00	92	00	do	do	50
	Versailles	38	00	92	30	do	do	50

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			Feet.
ouri	Warsaw	38	00	93	00	¼ degree	1:125000	50
	Clinton	38	00	93	30	do	do	50
	Butler	38	00	94	00	do	do	50
	Bolivar	37	30	93	00	do	do	50
	Stockton	37	30	93	30	do	do	50
	Nevada	37	30	94	00	do	do	50
	Springfield	37	00	93	00	do	do	50
	Greenfield	37	00	93	30	do	do	50
	Carthage	37	00	94	00	do	do	50
ouri and Kansas	Atchison	39	30	95	00	do	do	50
	Kansas City	39	00	94	30	do	do	50
	Olathe	38	30	94	30	do	do	50
	Mound City	38	00	94	30	do	do	50
	Fort Scott	37	30	94	30	do	do	50
	Joplin	37	00	94	30	do	do	50
as	Hiawatha	39	30	95	30	do	do	50
	Seneca	39	30	96	00	do	do	50
	Marysville	39	30	96	30	do	do	50
	Oskaloosa	39	00	95	00	do	do	50
	Topeka	39	00	95	30	do	do	50
	Wamego	39	00	96	00	do	do	50
	Junction City	39	00	96	30	do	do	50
	Lawrence	38	30	95	00	do	do	50
	Burlingame	38	30	95	30	do	do	50
	Eskridge	38	30	96	00	do	do	50
	Parkerville	38	30	96	30	do	do	50
	Abilene	38	30	97	00	do	do	50
	Garnett	38	00	95	00	do	do	50
	Burlington	38	00	95	30	do	do	50
	Emporia	38	00	96	00	do	do	50
	Cotttonwood Falls	38	00	96	30	do	do	50
	Newton	38	00	97	00	do	do	50
	Hutchinson	38	00	97	30	do	do	20
	Lyons	38	00	98	00	do	do	20
	Great Bend	38	00	98	30	do	do	20
	Larned	38	00	99	00	do	do	20
	Ness City	38	00	99	30	do	do	20
	Iola	37	30	95	00	do	do	50
	Fredonia	37	30	95	30	do	do	50
	Eureka	37	30	96	00	do	do	50
	Eldorado	37	30	96	30	do	do	50
	Wichita	37	30	97	00	do	do	50
	Cheney	37	30	97	30	do	do	20
	Kingman	37	30	98	00	do	do	20
	Pratt	37	30	98	30	do	do	20
	Kinsley	37	30	99	00	do	do	20
	Spearville	37	30	99	30	do	do	20
	Parsons	37	00	95	00	do	do	50
	Independence	37	00	95	30	do	do	50
	Sedan	37	00	96	00	do	do	50
	Burden	87	00	96	30	do	do	50
	Wellington	37	00	97	00	do	do	50
	Caldwell	37	00	97	30	do	do	20
	Anthony	37	00	98	00	do	do	20

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			*Feet.*
Kansas	**Dodge**	37	30	100	00	¼ degree	1:125000	20
	Meade	37	00	100	00	...do	....do	20
	Clay Center	39	00	97	00	...do	....do	20
	Concordia	39	30	97	30	1/16 degree	....do	20
	Minneapolis	39	00	97	30	...do	....do	20
	Medicine Lodge	37	00	98	30	...do	....do	20
	Coldwater	37	00	99	00	...do	....do	20
	Salina	38	30	97	30	...do	....do	20
	Washington	39	00	97	00	...do	....do	20
Arkansas	**Mountain View**	36	30	92	00	...do	....do	50
	Marshall	35	30	92	30	...do	....do	50
	Morrillton	35	00	92	30	...do	....do	50
	Dardanelle	35	00	93	00	...do	....do	50
	Magazine Mountain	35	00	93	30	...do	....do	50
	Fort Smith	35	00	94	00	...do	....do	50
	Benton	34	30	92	30	...do	....do	50
	Hot Springs	34	30	93	00	...do	....do	50
	Mount Ida	34	30	93	30	...do	....do	50
	Poteau Mountain	34	30	94	00	...do	....do	50
	Aplin	35	00	93	00	1 degree	1:62500	20
	Greenwood	35	00	94	15	...do	....do	20
	Atkins	35	00	92	45	...do	....do	20
	Washburn	35	00	94	00	...do	....do	20
	Petit Jean	35	00	92	45	...do	....do	20
	Danville	35	00	93	15	...do	....do	20
	Russellville	35	15	93	00	...do	....do	20
	Clarksville	35	15	93	15	...do	....do	20
	Coal Hill	35	15	93	30	...do	....do	20
	Van Buren	35	15	94	15	...do	....do	20
	Arbuckle	35	15	94	00	...do	....do	20
	Ozark	35	15	93	45	...do	....do	20
	Oak Mountain	35	15	92	45	...do	....do	20
	Mountain Home	36	00	92	00	¼ degree	1:125000	50
	Batesville	35	30	91	30	...do	....do	50
	Little Rock	34	30	92	00	...do	....do	50
	Yellville	36	00	92	30	...do	....do	50
Texas	**Dallas**	32	30	96	30	...do	....do	20
	Fort Worth	32	30	97	00	...do	....do	20
	Weatherford	32	30	97	30	...do	....do	50
	Palo Pinto	32	30	98	00	...do	....do	50
	Breckenridge	32	30	98	30	...do	....do	50
	Albany	32	30	99	00	...do	....do	50
	Anson	32	30	99	30	...do	....do	50
	Cleburne	32	00	97	00	...do	....do	50
	Granbury	32	00	97	30	...do	....do	50
	Stephenville	32	00	98	00	...do	....do	50
	Eastland	32	00	98	30	...do	....do	50
	Meridian	31	30	97	30	...do	....do	50
	Hamilton	31	30	98	00	...do	....do	50
	Brownwood	31	30	98	30	...do	....do	50
	Coleman	31	30	99	00	...do	....do	50
	Gatesville	31	00	97	30	...do	....do	50
	Lampasas	31	00	98	00	...do	....do	50
	San Saba	31	00	98	30	...do	....do	50

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			Feet.
Texas	Brady	31	00	99	00	½ degree.	1:125000	50
	Taylor	30	30	97	00	...do ...	...do ...	50
	Georgetown	30	30	97	30	...do ...	...do ...	50
	Burnet	30	30	98	00	...do ...	...do ...	50
	Llano	30	30	98	30	...do ...	...do ...	50
	Mason	30	30	99	00	...do ...	...do ...	50
	Bastrop	30	00	97	00	...do ...	...do ...	50
	Austin	30	00	97	30	...do ...	...do ...	50
	Blanco	30	00	98	00	...do ...	...do ...	50
	Fredericksburg	30	00	98	30	...do ...	...do ...	50
	Kerrville	30	00	99	00	...do ...	...do ...	50
	Albany	32	30	99	00	...do ...	...do ...	50
	Hayrick	31	30	100	00	...do ...	...do ...	50
	San Angelo	31	00	100	00	...do ...	...do ...	50
	Waco	31	30	97	00	...do ...	...do ...	50
	Temple	31	00	97	00	...do ...	...do ...	50
	Eden	31	00	99	30	...do ...	...do ...	50
	Abilene	32	00	99	30	...do ...	...do ...	50
	Ballinger	31	30	99	30	...do ...	...do ...	50
	Sierra Blanca	31	00	105	00	...do ...	...do ...	50
	Roby	32	30	100	00	...do ...	...do ...	25
	Nueces	29	30	100	00	...do ...	...do ...	25
South Dakota	Rapid City	44	00	103	00	...do ...	...do ...	100
Montana	Fort Benton	47	00	110	00	1 degree.	1:250000	200
	Great Falls	47	00	111	00	...do ...	...do ...	200
	Big Snowy Mountain	46	00	109	00	...do ...	...do ...	200
	Little Belt Mountain	46	00	110	00	...do ...	...do ...	200
	Fort Logan	46	00	111	00	...do ...	...do ...	200
	Helena	46	00	112	00	...do ...	...do ...	200
	Livingston	45	00	110	00	...do ...	...do ...	200
	Three Forks	45	00	111	00	...do ...	...do ...	200
	Dillon	45	00	112	00	...do ...	...do ...	200
	Big Timber	45	30	109	30	½ degree.	1:125000	50
	Stillwater	45	30	109	00	...do ...	...do ...	50
	Huntley	45	30	108	00	...do ...	1:62500	50
Yellowstone National Park.	Canyon	44	30	110	00	...do ...	1:125000	100
	Gallatin	44	30	110	30	...do ...	...do ...	100
	Lake	44	00	110	00	...do ...	...do ...	100
	Shoshone	44	00	110	30	...do ...	...do ...	100
Wyoming	Fort Steele	41	30	106	30	...do ...	...do ...	25 and 50
Idaho	Camas Prairie	43	00	115	00	...do ...	...do ...	100
	Mountain Home	43	00	115	30	...do ...	...do ...	100
	Bisuka	43	00	116	00	...do ...	...do ...	25, 50, 100
	Boise	43	30	116	00	...do ...	...do ...	25, 50, 100
	Nampa	43	30	116	30	...do ...	...do ...	50 and 100
	Bear Valley	44	00	115	00	...do ...	...do ...	100
	Squaw Valley	44	00	116	00	...do ...	...do ...	100
Oregon	Klamath	42	00	121	00	1 degree.	1:250000	200
	Ashland	42	00	122	00	...do ...	...do ...	200
Colorado	East Denver	39	30	104	30	½ degree.	1:125000	50
	Crested Butte	38	45	106	45	1/16 degree	1:62500	100
	Anthracite	38	45	107	00	...do ...	...do ...	100
	Arroya	38	30	103	00	½ degree.	1:125000	100
	Sanborn	38	30	103	30	...do ...	...do ...	100

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			*Feet.*
Colorado	Big Springs	38	30	104	00	½ degree.	1:125000	100
	Las Animas	38	00	103	00	do	do	100
	Catlin	38	00	103	30	do	do	100
	Nepesta	38	00	104	00	do	do	100
	Pueblo	38	00	104	30	do	do	100
	Higbee	37	30	103	00	do	do	100
	Timpas	37	30	103	30	do	do	100
	Apishapa	37	30	104	00	do	do	100
	Kit Carson	38	30	102	30	do	do	25
	Vilas	37	00	102	00	do	do	25
	Lamar	38	00	102	30	do	do	25
	Cheyenne Wells	38	30	102	00	do	do	25
	Limon	39	00	103	30	do	do	25
	Leadville	39	00	106	00	do	do	25, 50, 100
	Huerfano Park	37	30	105	00	do	do	25, 50, 100
	Walsenburg	37	30	104	30	do	do	25, 50, 100
	Colorado Springs	38	30	104	30	do	do	25, 50, 100
	El Moro	37	00	104	00	do	do	25, 50, 100
	Canyon City	38	00	105	00	do	do	25, 50, 100
	Trinidad	37	00	104	30	do	do	25, 50, 100
	Mesa de Maya	37	00	103	30	do	do	25, 50, 100
	Mount Carriso	37	00	103	00	do	do	25, 50, 100
	Two Butte	37	30	102	30	do	do	25 and 50
	Springfield	37	00	102	30	do	do	25 and 50
	Platte Canyon	39	00	105	00	do	do	25, 50, 100
Colorado and Kansas	Grenada	38	00	102	00	do	do	25
Colorado and Utah	Ashley	40	00	109	00	1 degree.	1:250000	250
	East Tavaputs	39	00	109	00	do	do	250
	La Sal	38	00	109	00	do	do	250
	Abajo	37	00	109	00	do	do	250
Utah	Uinta	40	00	110	00	do	do	250
	Salt Lake	40	00	111	00	do	do	250
	Tooele Valley	40	00	112	00	do	do	250
	Price River	39	00	110	00	do	do	250
	Manti	39	00	111	00	do	do	250
	Sevier Desert	39	00	112	00	do	do	250
	San Rafael	38	00	110	00	do	do	250
	Fish Lake	38	00	111	00	do	do	250
	Beaver	38	00	112	00	do	do	250
	Henry Mountain	37	00	110	00	do	do	250
	Escalante	37	00	111	00	do	do	250
	Kanab	37	00	112	00	do	do	250
	St. George	37	00	113	00	do	do	250
Utah and Nevada	Pioche	37	00	114	00	do	do	250
Nevada	Paradise	41	00	117	00	do	do	200
	Disaster	41	00	118	00	do	do	200
	Long Valley	41	00	119	00	do	do	200
	Granite Range	40	00	119	00	do	do	200
	Carson	39	00	119	30	½ degree.	1:125000	100
	Reno	39	30	119	30	do	do	100
	Wabuska	39	00	119	00	do	do	100
	Wadsworth	39	30	119	00	do	do	100
	Truckee	39	00	120	00	do	do	100
Nevada and California	Wellington	38	30	119	00	do	do	100
	Markleeville	38	30	119	30	do	do	100

Locality.	Name of sheet.	Designation of sheet.				Area covered.	Scale.	Contour interval.
		Lat.		Long.				
		°	′	°	′			Feet.
lifornia	Altoras	41	00	120	00	1 degree.	1:250000	200
	Modoc Lava Bed	41	00	121	00	...do	....do	200
	Shasta	41	00	122	00	...do	....do	200
	Honey Lake	40	00	120	00	...do	....do	200
	Lassen Peak	40	00	121	00	...do	....do	200
	Red Bluff	40	00	122	00	...do	....do	200
	Downieville	39	30	120	30	½ degree.	1:125000	50
	Bidwell Bar	39	30	121	00	...do	....do	50
	Chico	39	30	121	30	...do	....do	100
	Colfax	39	00	120	30	...do	....do	100
	Nevada City	39	00	121	00	...do	....do	100
	Marysville	39	00	121	30	...do	....do	100
	Placerville	38	30	120	30	...do	....do	100
	Sacramento	38	30	121	00	...do	....do	100
	Jackson	38	00	120	30	...do	....do	100
	Pyramid Peak	38	30	120	00	...do	....do	100
	Sierraville	39	30	120	00	...do	....do	100
	Sonora	37	30	120	00	...do	....do	100
	Escondido	33	00	117	00	⅛ degree	1:62500	25
	Oceanside	33	00	117	15	...do	....do	25
	El Cajon	32	45	116	45	...do	....do	25
Mexico	Largo	36	00	107	00	1 degree.	1:250000	200
	Chaco	36	00	108	00	...do	....do	200
	Santa Clara	35	30	106	00	½ degree.	1:125000	100
	Jemez	35	30	106	30	...do	....do	100
	Albuquerque	35	00	106	30	...do	....do	50
	Mount Taylor	35	00	107	00	1 degree.	1:250000	200
	Wingate	35	00	108	00	...do	....do	200
	Las Vegas	35	30	105	00	½ degree.	1:125000	50
	Watrous	35	30	104	30	...do	....do	50
	Bernal	35	00	105	00	...do	....do	50
	Corazon	35	00	104	30	...do	....do	50
	Las Cruces	32	00	106	30	...do	....do	25 and 50
	Lamy	35	00	105	30	...do	....do	50 and 100
	San Pedro	35	00	106	00	...do	....do	50 and 100
	Santa Fe	35	30	105	30	...do	....do	100
Mexico and Arizona	Canyon de Chelly	36	00	109	00	1 degree.	1:250000	200
	Fort Defiance	35	00	109	00	...do	....do	200
	St. Johns	34	00	109	00	...do	....do	200
na	Marsh Pass	36	00	110	00	...do	....do	200
	Echo Cliffs	36	00	111	00	...do	....do	250
	Kaibab	36	00	112	00	...do	....do	250
	Mount Trumbull	36	00	113	00	...do	....do	250
	Tusayan	35	00	110	00	...do	....do	200
	San Francisco Mountain.	35	00	111	00	...do	....do	250
	Chino	35	00	112	00	...do	....do	250
	Diamond Creek	35	00	113	00	...do	....do	250
	Holbrook	34	00	110	00	...do	....do	200
	Verde	34	00	111	00	...do	....do	200
	Prescott	34	00	112	00	...do	....do	200
a and Nevada	St. Thomas	36	00	114	00	...do	....do	250
a, Nevada, and ornia.	Camp Mohave	35	00	114	00	...do	....do	250

SPECIAL TOPOGRAPHIC SHEETS.

Aspen, Colorado. Scale, 1:9,600; contour interval, 25 feet.
Banner Hill, California. Scale, 1:14,400; contour interval, 20 feet.
Grass Valley, California. Scale, 1:14,400; contour interval, 20 feet.
Genesee, California. Scale, 1:31,680; contour interval, 50 feet.
Taylorsville, California. Scale, 1:31,680; contour interval, 50 feet.
Indian Valley, California. Scale, 1:62,500; contour interval, 50 feet.

Other special topographic sheets accompany some of the volumes of text; see especially contents of atlases to monographs II, III, XII, XIII, XX, as detailed on pages 96, 98, 113, 115, and 125 of this bulletin.

MISCELLANEOUS TOPOGRAPHIC MAPS.

Contour map of the United States; scale 1:2,500,000. 9 sheets.

Contour map of the United States; scale 1:7,000,000. 1 sheet.

Hypsometric map of the United States; scale 1:7,000,000. 1 sheet.

Index map of the United States; scale 1:2,500,000. 9 sheets.

Base map of the United States; scale 1:7,000,000. 1 sheet.

Base map of the United States; scale 1:14,000,000. 1 sheet.

Contour map of the state of Massachusetts; scale 1:250,000. 4 sheets.

Contour map of the state of Connecticut; scale 1:125,000. 4 sheets.

Contour map of the states of Massachusetts and Rhode Island; scale 1:250,000. 4 sheets.

Contour map of the drainage basin of the Arkansas river in Colorado; scale 1:380,160. 2 sheets.

These miscellaneous maps are compilations.

MISCELLANEOUS PUBLICATIONS.

CIRCULARS OF INSTRUCTIONS.

ircular no. 1.) | Department of the interior, | United States geo-
al survey, | office of the director, | Washington, July 16, 1879.

mall sheet, measuring about 5 by 8 inches, with the above heading, and
d "Clarence King, director." It calls the attention of officers and employees
survey to the provision of law prohibiting personal or private interest by
irector and members of the survey in the lands or mineral wealth of the re-
under survey and their execution of surveys or examinations for private parties
porations.

rcular no. 2. | Department of the interior, | United States geo-
al survey, | office of the director, | Washington, July 16, 1879.

nall sheet, measuring about 5 by 8 inches, with the above heading, and signed
ence King, director." It relates to official correspondence.

cular no. 3. | Department of the interior, | United States geologi-
irvey, | office of the director, | Washington, D. C., April 1, 1880.

mall circular, pp. [1]-3, verso blank, measuring about 5 by 8 inches, and
"Clarence King, director." It relates to reports to be rendered by disbursing
s.

rcular no. 4.) | Department of the interior, | United States geo-
l survey, | office of the director, | Washington, May 26, 1880.

iall sheet, measuring about 5 by 8 inches, with the above heading, and signed
ence King, director." It relates to the entering by members of the survey of
e or corporate mining property and to giving expert testimony in lawsuits.

cular no. 5. | Department of the interior, | United States geological
y, | office of the director, | Washington, D. C., September 10,
| Instructions relating to the form of the reports of the | U. S.
gical survey.

iall circular, 2 leaves (verso of each blank), measuring about 5 by 8 inches,
ned "J. W. Powell, director." 1,500 copies issued.

cular no. 6. | Department of the interior, | United States geolog-
irvey, | Washington, D. C., June 6, 1882.

all sheet, measuring about 5 by 8 inches, with the above heading, and signed
. Powell, director." It relates to the survey ration. 250 copies issued.

e six circulars of instructions were rescinded and superseded by the follow-

REGULATIONS.

United States geological survey | J. W. Powell director | Regulations | of the | U. S. geological survey | [Survey design] |
Washington | government printing office | 1882

Title as above, verso blank; contents, pp. v–vi; promulgating order by the director, dated Sept. 1, 1882, and approved by the acting secretary of the interior, p. [vii], verso blank; text, pp. 1–51. 8°. Bound in cloth and lettered on front cover: "Regulations | of the | U. S. geological survey | 1882". 200 copies were issued in this form. Besides these there were 50 copies issued with paper covers, the full title being repeated on the cover.

		Page.
Chapter I.	Organic law of the survey, with instructions relating to its provisions	1-2
Chapter II.	Instructions relating to money and property	3–36
Chapter III.	Instructions relative to bonded railroads	37–43
Chapter IV.	Instructions relating to collections	44–46
Chapter V.	Instructions relating to publications	47–50
Chapter VI.	Miscellaneous instructions	51

A revision of these Regulations is in an advanced state of preparation.

CIRCULAR CONCERNING PUBLICATIONS.

Department of the interior, | United States geological survey, | Washington, D. C., ... 188 . | Circular concerning publications.
[Washington: government printing office. 1882.]

One leaf (two unnumbered pages), with heading as above. 4°. 1,000 copies.

Brief titles, collations, contents, and prices are given, the whole preceded by information respecting the distribution of the reports.

This circular has been revised and reissued from time to time, and has, of course, grown with the increase of survey publications. The last one at this writing is as follows:

(9–320.) | Department of the interior | United States geological survey | J. W. Powell, director | List | of the | publications | of the | U. S. geological survey | J. W. Powell | director | [Survey design] |
Washington | government printing office | 1893

Paper cover bearing title as above; inner title same, verso blank; prefatory note, p. 3, verso blank; the list of survey publications, pp. 5–44; finding list, showing where in the congressional documents the publications of the U. S. geological survey are to be found, pp. 45–46. 8°. 2,500 copies.

GUYOT'S TABLES.

Guyot's tables | for | computing differences of elevation | from | barometric observations. | (Extract from Smithsonian miscellaneous collections, no. 31.)
[Washington: government printing office. 1884.]

Paper cover bearing half-title as above; inner half-title same, verso blank; text, pp. 3–8; tables, pp. 9–18. 8°. 100 copies issued by the department of the interior on survey requisition.

HISTORY OF AMERICAN STATE SURVEYS.

partment of the interior, | United States geological survey. | A
osed | history of American state surveys. |
lophon: Washington, D. C., April 10, 1885.

title; heading as given above; pp. [1]–4. 8°. 100 copies printed for distribu-
mong gentlemen invited to contribute to the proposed history, accompanied
ters from the director.

r setting forth the purpose, scope, and manner of compilation of the proposed
y, the information desired from contributors is indicated by a series of ques-
grouped under the five following heads:

Questions relating to organization.
Questions relating to administration.
Questions relating to cost.
Questions relating to publications.
Benefits resulting from the survey.

S AND SUGGESTIONS FOR PREPARATION OF MANUSCRIPT AND ILLUSTRATIONS.

es | for the | preparation of manuscript and illustrations | de-
l for publication by the United | States geological survey. | By |
as Hampson. | January, 1888.
shington: government printing office. 1888.]

r cover bearing half-title as above; inner half-title same, verso blank; letter
smittal to the director and approval of the rules by the director, pp. 3–4; the
p. 5–19, verso blank; blank pages for manuscript additions or changes, pp.
eaded "Rules" at the top of p. 21). 8°. 500 copies published.

ollowing is a revision of these rules:

gestions | for the | preparation of manuscript and illustrations
ublication by the U. S. geological survey. | By W. A. Croffut. |
ry, 1892.
shington: government printing office, 1892.]

itle on paper cover as above; inner half-title the same, verso blank; letter
mittal and approval of the director, p. 3, verso blank; text, pp. 5–15. 8°.
es published.

N'S REPORT ON THE IRON REGIONS OF LOUISIANA AND TEXAS.

congress, | 1st session. | House of representatives. | Ex. doc. |
. | Report | The iron regions | of | northern Louisiana | and |
Texas. |
hington: | government printing office. | 1888.

s above, verso blank; contents, p. 3, verso blank; illustrations, p. 5, verso
etter of transmittal by the secretary of the interior to the speaker of the
representatives, p. 7, verso blank; letter of transmittal by the director of
y to the secretary of the interior, p. 9; letter of transmittal by the author,
e C. Johnson, assistant geologist, to the director, pp. 9–10; text, pp. 11–54.
e I (being a map of the region reported on); figs. 1–13. 1,734 copies, the
umber."

minary report, made in response to a resolution of inquiry of the house of
atives.

DIGEST OF DECISIONS CONCERNING WATER IN THE ARID REGION.

A digest | of | the decisions | of the | supreme courts of the states and territories of the | arid region and of the United States circuit | and supreme courts in cases involving | questions relative to the use and | control of water in that region. | Compiled by | D. W. Campbell, esq., | of the United States geological survey; | revised and edited, under the direction of the secretary of the interior, by | W. C. Pollock, esq., | of the assistant attorney-general's office for the interior department. |

Washington: | government printing office. | 1889.

Title as above, verso blank; text, arranged alphabetically by subject matter of decision (e. g., ditch, flumes, riparian), pp. 3-59. 8°. 1,000 copies published; bound in sheep.

INDEX

TO THE

PUBLICATIONS OF THE U. S. GEOLOGICAL SURVEY.

INDEX TO THE PUBLICATIONS OF THE U. S. GEOLOGICAL SURVEY.

Abbreviations: Ann = Annual Report; Mon = Monograph; Bull = Bulletin; MR = Mineral Resources; I = part I; II = part II; p = page; pp = pages.

Aa type of lava, character of........Ann 4, p 95
Acadian area of the Newark system........Bull 85, pp 19–20, 80
Acadian province, the upper Paleozoic formations in the, correlations and classifications of........Bull 80, pp 226–257
Acadian. See, also, Canada.
Accretions formed in the blast furnace........Mon XII, pp 725–731
Actinolite, secondary character of........Ann 10, I, p 407
Actinozoa from the Devonian of the Eureka district, Nevada...Mon VIII, pp 100–106
Actinozoa of the Olenellus zone........Ann 10, I, pp 599–602
Adirondacks, pre-Cambrian rocks of the........Bull 86, pp 398–399, 413–414, 508
Æolian sands in the Great basin........Mon XI, pp 153–156
Æolian soils........Ann 12, I, pp 326–329
Africa, copper production of, statistics of the....MR 1883–84, pp 356, 370; MR 1885, pp 229, 242; MR 1886, pp 128, 139; MR 1887, pp 88, 96–97; MR 1888, p 73; MR 1889–90, p 73; MR 1891, p 101
Africa, diamond mines and production of........MR 1887, pp 563–568
Africa, fossil plants of, literature of the........Ann 8, II, pp 799–803
Africa, gold production of, compared with that of other portions of the world........MR 1883–84, pp 319, 320
Africa; irrigation by artesian waters in Algeria........Ann 11, II, pp 265–266
Agassiz, the glacial lake, upper beaches and deltas of........Bull 39
Agatized wood formations in Arizona........MR 1891, pp 548–549
Agglomerates, diabasic, relations of, to greenstone schists in the Marquette district, Michigan........Bull 62, pp 185–191
Agnotozoic proposed as a name for a system of rocks between the Archean and the Paleozoic.....Ann 7, pp 454–455; Bull 86, pp. 147, 148, 461, 462, 475, 491, 493
Alabama, altitudes of localities in........Bull 5, pp 25–28; Bull 76
Alabama, artesian wells in........Ann 11, II, p 263
Alabama, boundary lines of, and formation of state........Bull 13, pp 30, 102–103
Alabama, brick industry of, statistics of the....MR 1887, pp 535, 537; MR 1888, p 557
Alabama, coal areas and statistics of.....Ann 2, p xxviii; MR 1882, pp 35–37; MR 1883–84, pp 12, 14–17; MR 1885, pp 11, 13–14; MR 1886, pp 225, 230, 235–240; MR 1887, pp 169, 171, 189–207; MR 1888, pp 169, 171, 208–213; MR 1891, pp 180, 205
Alabama, coke in, the manufacture of..MR 1883–84, pp 154–157; MR 1885, pp 80, 85–87; MR 1886, pp 378, 384, 389–392; MR 1887, pp 383, 389, 394–395; MR 1888, pp 395, 400, 406–407; MR 1891, pp 360, 376
Alabama, copper mines in........MR 1882, p 231
Alabama, Cretaceous rocks of........Bull 82, pp 105–110, 216–217
Alabama; dolomite and residual clay from Morrisville, analysis of.....Bull 60, p 159

Alabama, Eocene deposits in ....Bull 83, pp 57–66, 83, 87

Alabama, fossils from...Ann 4, pp 296, 301, 310, 311; Ann 8, II, pp 878–879; Bull 4, p 16

Alabama, geologic and paleontologic investigations in...Ann 4, pp 43, 49–50; Ann 5, pp 52–53; Ann 6, pp 74, 75; Ann 7, pp 67, 114; Ann 8, I, p 129; Ann 9, pp 76, 122, 132; Ann 10, I, pp 120, 121, 157, 174; Ann 11, I, p 67; Ann 12, I, pp 74, 75, 79

Alabama, geologic maps of, listed.......................Bull 7, pp 103, 109, 110, 111, 167

Alabama, gold from, statistics of.............Ann 2, p 385; MR 1882, pp 176, 177, 178; MR 1889–90, p 49; MR 1891, p 77

Alabama, iron and steel from, statistics of.....Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 135, 136, 137, 149–161; MR 1883–84, pp 252, 278; MR 1885, pp 182, 184, 186; MR 1886, pp 18, 33, 85–92, 98; MR 1887, pp 11, 16, 49–50; MR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 11, 17, 18, 24, 35, 36, 39, 40, 41; MR 1891, pp 12, 19, 61

Alabama, iron ores of, in their geological relations ....MR 1882, pp 149–161

Alabama, lime production of...MR 1887, p 532

Alabama; limestone from Chewacla, Lee county, analysis of ......MR 1889–90, p 377

Alabama, manganese ore in...................MR 1885, p 345; MR 1886, pp 181, 183

Alabama, mineral springs of....................Bull 32, pp 88–94; MR 1883–84, p 979; MR 1885, p 536; MR 1886, p 715; MR 1887, p 683; MR 1888, p 626; MR 1889–90, pp 522, 524; MR 1891, pp 603, 604

Alabama, minerals of, the useful.........MR 1882, pp 667–670; MR 1887, pp 690–695

Alabama, Neocene beds of ....Bull 84, pp 159–160

Alabama, phosphate deposits of ....Bull 46, pp 75–78; MR 1883–84, pp 794–803; MR 1886, p 618

Alabama, tin ore in ....MR 1882, pp 434–436; MR 1883–84, pp 601–602

Alabama, topographic work in.......Ann 6, pp 9, 10; Ann 7, pp 50, 52; Ann 8, p 102; Ann 9, pp 54, 55; Ann 10, I, pp 91, 92; Ann 11, I, p 37

Alabama; white earth from Talladega, analysis of....................Bull 60, p 158

Alabama, Tuscaloosa, and Tombigbee rivers, Tertiary and Cretaceous strata of the..Bull 43

Alachua clays of Florida ....Bull 84, pp 127–130

Alaska, altitudes of localities in...Bull 5, p 29

Alaska, Cenozoic epoch in, general considerations on the........Bull 84, pp 276–277

Alaska, cinnabar in...Mon XIII, pp 384–385

Alaska, coal deposits and industry in..... MR 1883–84, p 17; MR 1885, p 14; MR 1888, pp 214–216; MR 1891, pp 209–210

Alaska, Cretaceous deposits of......................................Bull 82, pp 205–206

Alaska, fossil plants of, literature of the.........................Ann 8, II, pp 924–926

Alaska, fossils from.........................Ann 8, II, pp 924–926; Bull 82, pp 205–206

Alaska, geologic investigations in............Ann 11, I, pp 57–58; Ann 12, I, pp 59–61

Alaska, glaciers of ....Ann 5, pp 348–355

Alaska, gold and silver from, statistics of....Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 76, 77, 78, 79

Alaska; hornblende-andesite from Hague volcano, Bogusloff island, Bering sea, analysis of..Bull 27, pp 63–64

Alaska, jade and pectolite from, analyses of ....Bull 9, pp 9–10

Alaska, Mesozoic fossils from ....Bull 4, pp 10–15

Alaska; Mesozoic Mollusca from the southern coast of the Alaskan peninsula...Bull 51, pp 64–70

Alaska, mineral springs of.......................Bull 32, pp 218–219; MR 1882, p 979

Alaska, minerals of, the useful...............MR 1882, p 760; MR 1887, pp 695–696

Alaska, Neocene formations of, summary of our knowledge of the..Bull 84, pp 234–268

Alaska, purchase of, from Russia, boundaries of, etc..................Bull 13, p 23

Alaska, rocks of, general notes on the........................Bull 84, pp 232–234
Alaska. See, also, Arctic.
Albite from Litchfield, Maine, analysis of........................Bull 42, pp 34–35
Albuquerque district, New Mexico, irrigation in the...........Ann 12, II, pp 270–273
Alcohol, compressibility and thermal expansion of..................Bull 92, pp 30–32
Aleutian islands, lignitic beds of the..........................Bull 84, pp 242–249
Algæ of hot springs..Ann 9, pp 657–666
Algeria, irrigation in.....................................Ann 11, II, pp 265–266
Algonkian; classification of the early Cambrian and pre-Cambrian formations..An n7, pp 371–454
Algonkian; copper-bearing rocks of lake Superior.......Ann 1, pp 70–71; Ann 2, pp xxxi–xxxiv; Ann 3, pp 89–188; Mon v
Algonkian; crystalline schists of the lake Superior region....Ann 10, I, pp 355–364
Algonkian; greenstone-schist areas of the Monominee and Marquette regions of Michigan, a contribution to the subject of dynamic metamorphism in eruptive rocks..Bull 62
Algonkian; Huronian areas, investigations in....................Ann 5, pp 187–208
Algonkian; Huronian defined....................................Bull 86, p 463
Algonkian; Huronian of the northwestern states, metamorphism in the..Ann 5, pp 241–242
Algonkian; Huronian quartzites, genesis of and metamorphism in...Bull 8, pp 48–52
Algonkian; Huronian rocks, enlargements in......................Bull 8, pp 23–37
Algonkian; Huronian rocks of the lake Superior region...Mon v, pp 386–394, 402–409
Algonkian; Huronian system, history of the term..............Bull 86, pp 470–474
Algonkian; Huronian, the original....................Bull 86, pp 23–50, 498–499
Algonkian; Huronian and Laurentian, relations of the Keweenawan rocks to the..Ann 3, pp 156–173
Algonkian; Huronian and Laurentian, relations of the Penokee iron-bearing series of Michigan and Wisconsin to the................Ann 10, I, pp 458–464
Algonkian; Keweenaw series, lake Superior, the junction between the Eastern sandstone and the..Bull 23
Algonkian; Keweenawan rocks of lake Superior, chronologic list of works that embrace references to the.....................Mon v, pp 14–23, 431–432
Algonkian; Keweenawan rocks of the lake Superior basin, extent and general nature of the......Ann 3, pp 93–188; Mon v, pp 24–409; Bull 86, pp 160–162
Algonkian of Texas..Bull 45, pp 55–56
Algonkian; Penokee iron-bearing series of Michigan and Wisconsin...Ann 10, I, pp 341–507; Mon XIX
Algonkian period to be used in the geologic atlas of the United States..Ann 10, I, p 20
Algonkian strata, table showing classification of the...............Ann 10, I, p 546
Algonkian and Archean, a correlation essay, by C. R. Van Hise...............Bull 86
Algonkian and Archean rocks of North America as related to the Cambrian..Ann 12, I, pp 540–563
Alkalies in silicates, estimation of..............................Bull 9, pp 36–37
Allanite from Topsham, Me., description and analysis of.................Bull 9, p 10
Allanite in igneous rocks of the Eureka district, Nevada...Mon XX, pp 338, 341, 379
Allanite in porphyries of the Mosquito range, Colorado........Mon XII, pp 329, 335
Allanite in porphyrites of the Henry mountains.....................Mon XII, p 360
Alloys, a new method of making...............................Bull 60, pp 147–148
Alloys, thermoelectric data of.................................Bull 14, pp 80–88
Alluvial cones and terraces...Ann 2, p 184; Ann 4, pp 201–202; Ann 6, p 311; Mon I, pp 81, 91, 92, 178, 185, 220, 344, 346, 349, 352; Mon XI, pp 255–257
Alluvial soils..Ann 12, I, pp 288–293
Altamaha grit of Georgia..Bull 84, pp 81–82
Alteration products, miscellaneous, analyses of....................Mon XII, p 607

Altitudes, a new method of measuring, with the barometer ....Ann 2, pp 403–566
Altitudes between lake Superior and the Rocky mountains..................Bull 72
Altitudes in the Bonneville basin ....Mon I, pp 405–419
Altitudes in the Dominion of Canada...Bull 6
Altitudes in the United States, dictionary of ....Bull 5; Bull 76
Alum, foreign sources of..MR 1883–84, p 950
Alum, statistics of..............MR 1882, p 606; MR 1883–84, pp 949–950; MR 1886, pp 681–682; MR 1887, pp 646–647
Alum rock, so-called, from Grant county, New Mexico, analyses of......Bull 9, p 13
Aluminum, analyses of ....MR 1883–84, p 659
Aluminum, separation of, in rock analyses ....Bull 78, pp 87–90
Aluminum, statistics of......MR 1882, p 445; MR 1883–84, pp 658–660; MR 1885, pp 390–392; MR 1886, pp 220–221; MR 1887, pp 138–141; MR 1888, pp 160–164; MR 1889–90, pp 110–118; MR 1891, pp 147–163
Aluminum, the ore of (bauxite), analyses of....................MR 1891, pp 152–154
Aluminum and titanium, separation of, and of titanium and iron ..Bull 27, pp 16–26
Aluminum foil, action of various acids on..........................MR 1891, p 157
Amphibolite of the Mosquito range, Colorado, described...............Mon XII, p 50
Amygdaloid, diabasic, of the Keweenaw series........................Mon V, pp 87–91
Amygdaloidal rocks of the Keweenaw series, structural features of the........Mon V, pp 134–139
Amyl alcohol, the action of, on the chlorides, a method for the separation of sodium and potassium from lithium by, with some reference to a similar separation of the same from magnesium and calcium ....Bull 42, pp 73–88
Amyzon beds, correlation of the ....Bull 83, pp 141, 145–146
Amyzon group of rocks of Oregon ....Bull 84, p 281
Analcite from Table mountain, Colorado, general description, optical behavior, and chemical composition of.................................Bull 20, pp 27–29
Analyses, lists and, of the mineral springs of the United States...............Bull 32
Analyses, mineral, an apparatus for the determination of water in..Bull 78, pp 84–86
Analyses of waters of American rivers and springs and of inclosed lakes and oceans..Mon XI, pp 176–180
Analyses of waters of the Yellowstone national park, with an account of the methods of analysis employed...Bull 47
Analyses. See, also, the various substances: Coal, Clay, Iron, Rocks, Water, etc.
Andesite, augite-, of the Washoe district, Nevada, description and occurrence of...................................Mon III, pp 62–66, 126–130, 151, 201–203
Andesite, hornblende-, of the Washoe district, Nevada, description and occurrence of............Mon III, pp 53–62, 66–70, 116–125, 130–134, 199–201, 203–205
Andesite, hypersthene-, and triclinic pyroxene in augitic rocks.....Bull 1, pp 19–38
Andesite, pyroxene-, of the Eureka district, Nevada ....Mon XX, pp 239–242, 348–364
Andesites, classification of ....Mon XIII, pp 149–151
Andesites near Steamboat springs, Nevada.........Mon XIII, pp 146–151, 221, 334–337
Andesites of Buffalo peaks, Colorado ....Mon XII, pp 353–354
Andesites of the Eureka district, Nevada ....Mon XX, pp 233–237, 239, 348
Andesites of the quicksilver belt, California..Mon XIII, pp 152–156, 221, 238, 242–245
Andesites of the Tewan mountains, New Mexico.....................Bull 66, pp 12–15
Andesites of the Washoe district, Nevada, relations of the..Bull 17, pp 12–21, 23–26, 34
Andesites, transitions between types of.........................Mon XIII, pp 148–151
Andesitic pearlite of the Eureka district, Nevada ....Mon XX, pp 368–373
Angiosperms, fossil, of the Potomac or younger Mesozoic.........Mon XV, pp 277–325
Angiosperms. See, also, Monocotyledons; Dicotyledons.
Animals and plants in relation to soil formation................Ann 12, I, pp 268–287
Animikie series of rocks of lake Superior ....Mon XIX, pp 260–268, 468–470; Bull 86, pp 59, 187–189

Ann, cape, Massachusetts, geology of .... Ann 9, pp 529–611

Annealing of steel .... Bull 14, pp 40–59; Bull 94, pp 74–79

Anorthite determined in pyroxene-andesite .... Mon xx, p 353

Anorthite rock of the Keweenaw series described .... Mon v, pp 59–61, 438–440

Anorthoclase in lithophysæ, Obsidian cliff, Yellowstone park ..... Ann 7, pp 267–269

Antimony, foreign sources of .... MR 1883–84, pp 644–649

Antimony, statistics of..... MR 1882, pp 438–439; MR 1883–84, pp 641–653; MR 1885, pp 387–388; MR 1886, pp 2, 7, 9; MR 1887, pp 2, 6, 8–9; MR 1888, pp 10–11; MR 1889–90, pp 141–142; MR 1891, pp 174–176

Antimony ore, analyses of .... MR 1882, p 438

Ants as agents in soil formation .... Ann 12, I, pp 277–278

Apatites, analyses of .... Bull 46, pp 42, 44–46; MR 1883–84, pp 806, 808

Apatites, foreign .... Bull 46, pp 22–46

Apatites, statistics of.... MR 1882, p 521; MR 1883–84, pp 805–808; MR 1885, pp 455–458; MR 1887, p 594; MR 1888, p 596; MR 1889–90, pp 454–455

Apophyllite from Table mountain, Colorado, general description, optical properties, and chemical composition of .... Bull 20, pp 29–35

Appalachians, Cambrian and pre-Cambrian rocks of the .... Bull 86, 487

Appomattox or Lafayette formation. See Lafayette formation.

Aqueous vapor, thermal effect of the action of, on feldspathic rocks...... Ann 2, pp 325–330; Mon III, pp 290–308

Aqui mountains, literature of the geology of the .... Bull 86, pp 296, 506

Arachnids, index to the known fossil, of the world .... Bull 71

Arachnids, systematic review of our present knowledge of .... Bull 31, pp 19–31

Aragonite and calcite, formation of, in caves .... Mon VII, p 95

Aragonite crystals, measurement of the growth of .... Mon VII, pp 56–58

Arapaho beds, correlation of the .... Bull 83, pp 136–137, 145–146

Archæopteryx, comparison of Ichthyornis and Hesperornis with.... Ann 3, pp 83–85

Archean; Cambrian, the early, and pre-Cambrian formations, classification of.. Ann 7, pp 371–454

Archean; crystalline schists of the lake Superior region .... Ann 10, I, pp 355–364; Mon XIX, p 41

Archean formations of the northwestern states .... Ann 5, pp 175–242

Archean; gneisses of the lake Superior district, character of the ..... Ann 10, I, pp 358–360; Mon XIX, pp 107–111, 116–122

Archean; granite of the Sierra nevada, pre-sedimentary....... Mon XIII, pp 164–175

Archean; Huronian and Laurentian, relations of the Keweenawan rocks to the .... Ann 3, pp 156–173

Archean; Huronian and Laurentian, relations of the Penokee iron-bearing series to the .... Ann 10, I, pp 458–464; Mon XIX, pp 81, 82

Archean; Laurentian system, history of the term .... Bull 86, pp 462, 470–474

Archean; Laurentian, the original .... Bull 86, pp 23–50, 497–498

Archean, restriction of, to the gneissic basement terrane .... Ann 7, pp 450–452

Archean; southern complex of the Penokee district, lake Superior....... Ann 10, I, pp 353–364; Mon XIX, pp 103–126, 441–454

Archean rocks compared with Cretaceous metamorphics....... Mon XIII, pp 138, 458

Archean rocks in Texas .... Bull 45, pp 55–57

Archean rocks in the lowest deeps of the Grand canyon .... Mon II, p 207

Archean rocks in the upper Missouri region .... Ann 6, pp 49–50

Archean rocks in the vicinity of Chesapeake bay .... Ann 7, p 616

Archean rocks, investigation of the .... Ann 7, pp 17–18

Archean rocks of cape Ann, Massachusetts .... Ann 9, pp 576–610

Archean rocks of mount Desert, Maine .... Ann 8, II, pp 1035–1059

Archean rocks of northern Wisconsin, lithological character and origin of the .... Ann 10, I, pp 353–364

Archean rocks of northwestern Colorado ... Ann 9, pp 686–687
Archean rocks of the Leadville district, Colorado ... Ann 2, pp 215–216
Archean rocks of the Mosquito range, Colorado, petrographical descriptions of the ... Mon XII, pp 45–53, 93–94, 276–277
Archean rocks of the northwestern states ... Ann 5, pp 181–242
Archean rocks of the Plateau region ... Ann 6, pp 156–161
Archean rocks of the Uinta mountains ... Ann 9, pp 686–687
Archean rocks on south shore of lake Superior ... Bull 62
Archean rocks, possible character of (primeval) ... Mon XIII, pp 171–174
Archean and Algonkian, a correlation essay, by C. R. Van Hise ... Bull 86
Archean and Algonkian rocks of North America as related to the Cambrian ... Ann 12, I, pp 540–563
Archeology of the auriferous gravels of California ... Bull 84, pp 221–222
Arcose of the Coast ranges of California described ... Mon XIII, p 61
Arctic America, Cretaceous fossils from ... Bull 82, p 203
Arctic America, list of geological maps of ... Bull 7, pp 33–35
Arctic regions, literature of fossil plants from the ... Ann 8, II, pp 826–835
Arctic regions. See, also, Alaska.
Argentine Republic, copper production of ... MR 1883–84, p 356; MR 1885, p 229; MR 1886, p 128; MR 1887, p 88; MR 1888, p 73; MR 1889–90, p 73; MR 1891, p 101
Argentine Republic, fossil plants of, literature of the ... Ann 8, II, pp 821, 822
Argentine Republic, gold and silver production of, compared with that of other countries ... MR 1883–84, pp 319, 320
Arid region of United States, amount of, redeemable by irrigation ... Ann 11, II, pp 203–205
Arid region of United States and areas irrigated therein, map showing the .. Ann 11, II, pp ii–iii
Arid region of United States, hydrography of the ... Ann 10, II, pp 36, 78–90; Ann 11, II, pp 1–110; Ann 12, II, pp 213–361
Arid region of United States, location of the, and cause of its aridity ... Ann 12, II, pp 219–220
Arid region of United States. See, also, Irrigation.
Arizona, altitudes in ... Bull 5, pp 30–34; Bull 76
Arizona, boundary lines of, and formation of territory ... Bull 13, pp 32, 125
Arizona; brochantite from United Verde mine, Yavapai county, analysis of .. Bull 78, p 121
Arizona, Cambrian rocks in, correlation of the ... Bull 81, pp 219–221, 235, 356, 357, 385
Arizona, coal areas and statistics of ... MR 1882, p 37; MR 1883–84, p 18; MR 1885, p 14
Arizona, coal from, analysis of ... Bull 27, p 74
Arizona, copper, cupola smelting of, in ... MR 1883–84, pp 397–410
Arizona, copper from, statistics of ... Ann 2, p XXIX; MR 1882, pp 216, 221–224; MR 1883–84, pp 329, 334–336; MR 1885, pp 210, 215; MR 1886, pp 112, 116; MR 1887, pp 69, 74–75; MR 1888, pp 54, 58–59; MR 1889–90, pp 56, 60, 65; MR 1891, pp 83, 84
Arizona, Cretaceous rocks of ... Bull 82, p 154
Arizona, dumortierite from ... Bull 60, pp 133–135
Arizona, fossils from ... Ann 8, II, pp 916–917
Arizona, geologic and paleontologic investigations in ... Ann 1, pp 29–31; Ann 2, pp 8–9; Ann 4, pp 45–48; Ann 6, p 75; Ann 11, I, pp 114, 126
Arizona, geologic maps of, listed ... Bull 7, pp 140, 141, 142
Arizona; Gila river basin, hydrography of the ... Ann 11, II, pp 58–63, 100, 108; Ann 12, II, pp 292–316
Arizona; Gila river basin, irrigation problems relating to the .. Ann 11, II, pp 227–229

Arizona, gold and silver from, statistics of ....Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883-84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889-90, p 49; MR 1891, pp 75, 77, 78

Arizona; Grand canyon district, geography of the ....Ann 2, pp 70-73

Arizona; Grand canyon district, physical geology of the............Ann 2, pp 49-166

Arizona; Grand canyon district, Tertiary history of the...........Mon II and atlas

Arizona; Hassayampa disaster, causes of the ....Ann 11, II, pp 228-229

Arizona; hypersthene-andesite from San Francisco mountains, analysis of....Bull 42, p 139

Arizona, irrigation, hydrography, etc., in........................Ann 10, II, p 87

Arizona; kyanite from Clip, analysis of..................................Bull 78, p 120

Arizona, lead deposits in ....MR 1882, p 313; MR 1883-84, pp 416, 425; MR 1885, pp 248, 258-259; MR 1887, p 110; MR 1889-90, p 80

Arizona, mineral springs of...................Bull 32, pp 196-197; MR 1883-84, p 979

Arizona, minerals of, the useful ....MR 1882, pp 760-764; MR 1887, pp 696-700

Arizona, mining districts of ....MR 1882, pp 765-766

Arizona, rock formations in........................Bull 80, pp 215, 216, 221, 222, 224

Arizona; sandstone from Flagstaff, analysis of.........................Bull 78, p 124

Arizona, topographic work in.....Ann 1, pp 28-30; Ann 2, pp 6-8; Ann 6, pp 13-14; Ann 7, p 55; Ann 8, pp 104-105

Arizona, turquoise from..MR 1882, pp 493, 494

Arkansas, altitudes of localities in ....Bull 5, pp 35-36; Bull 76

Arkansas, boundary lines of, and admission of the state.....Bull 13, pp 30, 106-108

Arkansas, brick industry of.........................MR 1887, p 535; MR 1888, p 558

Arkansas, coal area and statistics of.................Ann 2, p xxviii; Bull 80, p 25; MR 1882, pp 37-38; MR 1883-84, pp 12, 18-19; MR 1885, pp 11, 15; MR 1886, pp 225, 230, 241; MR 1887, pp 169, 207-208; MR 1888, pp 169, 171, 216-224; MR 1889-90, pp 147, 174-178; MR 1891, pp 180, 210-212

Arkansas coals, analyses of.......................................MR 1889-90, p 176

Arkansas, Eocene deposits in....................................Bull 83, pp 74-75, 83

Arkansas, fossils from............Ann 4, pp 295-296; Ann 8, pp 896-897; Bull 4, p 16

Arkansas, geologic and paleontologic investigations in............Ann 10, I, p 157; Ann 11, I, p 75; Ann 12, I, pp 90, 107, 121

Arkansas, granite and marble production of........MR 1888, pp 537, 542; MR 1889-90, pp 374, 378; MR 1891, pp 457, 458

Arkansas kaolin, analyses of.......................................MR 1891, p 517

Arkansas, manganese deposits in......................MR 1883-84, p 553; MR 1885, p 305; MR 1885, pp 332-336; MR 1886, pp 181, 184-185; MR 1887, pp 145, 146, 147-150; MR 1888, pp 124, 125, 126-127; MR 1889-90, pp 127, 130; MR 1891, pp 127, 130-131

Arkansas, mineral springs of................................Bull 32, pp 118-122; MR 1883-84, p 980; MR 1885, p 536; MR 1886, p 715; MR 1887, p 683; MR 1888, p 626; MR 1889-90, pp 522, 524; MR 1891, p 604

Arkansas, minerals of, the useful........MR 1882, pp 670-672; MR 1887, pp 700-703

Arkansas; natrolite from Magnet cove, description and analysis of.....Bull 90, p 38

Arkansas, nickel deposits of..MR 1887, p 128

Arkansas, novaculite quarries in ....MR 1885, pp 433-434; MR 1886, p 589

Arkansas syenites, results of tests of...............................MR 1889-90, p 379

Arkansas, topographic work in......................Ann 4, pp 12, 13; Ann 9, p 56; Ann 10, I, pp 93, 95; Ann 11, I, p 40; Ann 12, I, p 30

Arkansas; water from two springs at Hominy hill, analyses of........Bull 60, p 173

Arkansas, waters from, analyses of...Bull 55, p 92

Arkansas; yellow smithsonite from Marion county, analysis of.........Bull 90, p 62

Arkansas, zinc works and statistics of............MR 1882, p 347; MR 1883–84, p 476; MR 1889–90, p 88
Arkansas river basin, hydrography of the............Ann 11, II, pp 45–52, 97
Arkansas river basin in Colorado and Kansas, irrigation problems relating to the............Ann 11, II, pp 210–214
Arkansas river in Colorado, surveys for reservoir sites along the............Ann 11, II, pp 133–144
Arsenic, statistics of......MR 1882, p 441; MR 1883–84, pp 656–657; MR 1885, p 386
Artesian problem along the Atlantic slope............Ann 7, pp 640–646
Artesian water, chemical impregnations of............Ann 5, pp 165–167
Artesian water, temperature of............Ann 5, p 165
Artesian wells in Kansas............Bull 57, pp 13, 30, 48
Artesian wells, requisite and qualifying conditions of............Ann 5, pp 125–173
Artesian wells and waters for irrigation in western United States, and in various countries............Ann 5, pp 148–150; Ann 11, II, pp 257–278
Artesian. See, also, Irrigation.
Arvonian terrane defined............Bull 86, pp 462–463
Asbestus, foreign sources of............MR 1883–84, p 913; MR 1885, p 521
Asbestus, relative value of, from different countries............MR 1882, p 589
Asbestus, statistics of.....MR 1882, pp 588–589; MR 1883–84, pp 913–914; MR 1885, pp 521–522; MR 1886, pp 5, 8, 9; MR 1887, pp 5, 7, 8–9; MR 1888, pp 8, 10–11; MR 1889–90, p 514; MR 1891, pp 591–592
Ashburner (C. A.), coal, statistics of......MR 1885, pp 10–73; MR 1886, pp 224–377; MR 1887, pp 168–382; MR 1888, pp 168–394
Ashburner (C. A.), description and production of the anthracite coal fields of Pennsylvania............MR 1882, pp 7–24
Ashley and Cooper beds of South Carolina............Bull 83, p 53
Asia, fossil plants of, literature of the............Ann 8, II, pp 786–799
Asia. See, also, China; India; Japan.
Asia Minor; basalt from the island of Mitylene, analysis of............Bull 60, p 158
Asia Minor, corundum deposits of............MR 1888, pp 429–432
Asia Minor, fossil plants of, literature of the............Ann 8, II, pp 798–799
Asperite, name proposed for andesites of trachytic habit......Mon XIII, pp 151, 459
Asperites of Steamboat springs, Nevada, described............Mon XIII, pp 335–337
Asperites of the Coast ranges of California described............Mon XIII, pp 222, 242
Asphalt, analyses of............MR 1883–84, pp 942, 944–947
Asphaltum deposits of California............MR 1883–84, pp 938–948
Asphaltum, foreign sources of............MR 1882, p 605; MR 1883–84, pp 937–938
Asphaltum, statistics of ....MR 1882, p 605; MR 1883–84, pp 937–948; MR 1885, pp 4, 6, 8; MR 1886, pp 5, 8, 10; MR 1887, pp 7, 8–9; MR 1888, pp 513–514; MR 1889–90, pp 477–481; MR 1891, pp 452–455
Assaying of Eureka ores, Nevada............Mon VII, pp 120–138, 144–145, 190
Assaying silver ore with the micrometer measuring apparatus....Ann 6, pp 331–352
Assays and assaying at Leadville, Colorado............Mon XII, pp 608, 621–625, 632–636, 695, etc.
Assays of Comstock rocks, Nevada............Mon III, pp 154–155
Assays of country rock of Eureka, Nevada............Mon VII, pp 82–87, 120–138
Assays of silver, experimental............Ann 6, pp 339–341, 349–352
Assays of tin ore............MR 1888, pp 146–147
Asteroidea of the United States............Bull 97, pp 29–32
Astoria group of Oregon and Alaska............Bull 84, pp 223–226, 252–259
Astronomical work of 1889 and 1890............Bull 70
Astrophyllite from El Paso county, Colorado, analysis of............Bull 78, p 119
Astrophyllite and tscheffkinite, new analyses of............Bull 90, pp 41–44
Atlantic system of rocks of New Hampshire............Bull 86, pp 351–355

Atlas sheets of the United States prepared by the Geological Survey and engraved to May 20, 1893, list of, by states .....See pp. 307-319 of this bulletin.

Atlas. See, also, Map.

Aucella, remarks on the genus, with especial reference to its occurrence in California..Mon xiii, pp 201-204, 226-232

Augite-andesite in the Washoe district, Nevada, description and occurrence of ....Mon iii, pp 62-66, 126-130, 151, 201-203

Augite-andesite of the Washoe district, Nevada, its relation to diabase.....Bull 17, pp 12-21, 40

Augite-syenite of the Keweenaw series described ....Mon v, pp 112-124

Auriferous gravels of California ....Bull 84, pp 219-222

Auriferous slate series of the Lassen peak district, California...Ann 8, i, pp 404-407

Auriferous. See, also, Gold.

Australia, Cambrian rocks of...................................Bull 81, pp 378-379

Australia, coal area and output of, compared with those of other countries MR 1882, p 5; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189

Australia, copper production of......MR 1882, pp 254-255; MR 1883-84, pp 356, 370-371; MR 1885, p 229; MR 1886, pp 128, 139; MR 1887, pp 88, 90; MR 1888, p 73; MR 1889-90, p 74; MR 1891, pp 101, 102

Australia, diamonds found in......................................MR 1887, p 569

Australia, fossil plants of, literature of the.....................Ann 8, ii, pp 807-814

Australia, gold and silver production of, compared with that of other countries...MR 1883-84, pp 319, 320

Australia, lead production of.......................MR 1883-84, p 434; MR 1885, p 264

Australia, quicksilver deposits in................................Mon xiii, pp 48-49

Australia, zinc production of.....................................MR 1887, p 117

Austria-Hungary, antimony production of ....MR 1883-84, p 646

Austria-Hungary, coal area and output of, compared with those of other countries..........................MR 1882, p 5; MR 1883-84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208

Austria-Hungary, copper production of................MR 1883-84, pp 356, 372-373; MR 1885, pp 228, 242; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1889-90, p 73; MR 1891, p 10

Austria-Hungary, fossil plants of, literature of the...............Ann 8, ii, pp 718-738

Austria-Hungary, gold and silver production of, compared with that of other countries..MR 1883-84, pp 319, 320

Austria-Hungary, iron and steel production of, compared with that of other countries ....MR 1882, p 109; MR 1883-84; p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889-90, pp 21, 22; MR 1891, pp 46, 73

Austria-Hungary, lead production of..MR 1883-84, pp 434, 439; MR 1885, pp 264, 271

Austria-Hungary, mining law of...................................MR 1883-84, p 1001

Austria-Hungary, quicksilver mines of.............Ann 8, ii, pp 965, 966; Mon xiii, pp 4, 5, 7, 14, 38-41

Austria-Hungary, quicksilver production of......MR 1882, pp 392, 393; MR 1883-84, p 496; MR 1885, p 293; MR 1887, p 125; MR 1888, p 106; MR 1891, p 124

Austria-Hungary, salt production of...............................MR 1883-84, p 849

Austria-Hungary, tin production of ....MR 1883-84, p 618

Austria-Hungary; uranium production of Bohemia ....MR 1882, p 448

Austria-Hungary, zinc production of...MR 1883-84, pp 480, 490-491; MR 1885, p 277; MR 1886, p 159; MR 1888, p 95; MR 1889-90, p 92; MR 1891, pp 113, 114

Azoic rocks, history of the term..................................Bull 86, pp 470, 473

Azoic. See, also, Archean.

Bad river series, Wisconsin ....Mon xix, pp 37-40

Barff-Bower process ....MR 1882, pp 164-171

Barium, etc., separation of, in rock analyses .... Bull 78, pp 87-90
Barnes (P.), present technical condition of the steel industry of the United States .... Bull 25
Barometer, new method of measuring heights with the .. Ann 2, pp xxxviii-xl, 403-566
Barometers, description of different kinds of .... Ann 2, pp 407-409
Barus (C.), administrative report for 1882-83 .... Ann 4, pp 52-59
Barus (C.), electrical activity of ore bodies .... Mon III, pp 309-367
Barus (C.), physical properties of the iron carburets .... Ann 4, pp 53-59
Barus (C.), subsidence of fine solid particles in liquids .. Bull 36; Bull 60, pp 139-145
Barus (C.), the compressibility of liquids .... Bull 92
Barus (C.), the mechanism of solid viscosity .... Bull 94
Barus (C.), the viscosity of solids .... Bull 73
Barus (C.), the volume thermodynamics of liquids .... Bull 96
Barus (C.), thermal effect of the action of aqueous vapor on feldspathic rocks .... Mon III, pp 290-308
Barus (C.), thermoelectric measurement of high temperatures ...... Ann 4, pp 53-59; Bull 54
Barus (C.) and Strouhal (V.), electrical and magnetic properties of the iron-carburets .... Bull 14
Barus (C.) and Strouhal (V.), physical properties of the iron-carburets (third paper) .... Bull 35
Barus (C.) and Strouhal (V.), relation between electrical resistance and density when varying with the temper of steel .... Bull 27, pp 30-50
Barus (C.) and Strouhal (V.), relation between time of exposure, temper value, and color in oxide films on steel .... Bull 27, pp 51-61
Barus (C.) and Strouhal (V.), the effect of sudden cooling exhibited by glass and by steel .... Bull 42, pp 98-131
Baryta in eruptive rocks, determination of .... Mon XII, p 577
Barytes, statistics of .... MR 1882, pp 580-581; MR 1883-84, pp 922-923; MR 1885, pp 524-525; MR 1886, pp 705-706; MR 1887, p 676; MR 1888, p 618; MR 1889-90, p 513; MR 1891, pp 599-600
Basalt from lava flows and cones of the Grand canyon district ..... Mon II, pp 81-83, 94-97, 104-112
Basalt from lavas of the Uinkaret plateau .... Ann 2, pp 118, 121-124
Basalt from mount Thielson, Oregon, analysis of .... Bull 9, p 15
Basalt from Pitt river, California, analysis of .... Bull 9, p 16
Basalt from six miles northeast of Grant, New Mexico, analysis of ..... Bull 42, p 140
Basalt from Table mountain, Golden, Colorado, zeolites in .... Bull 20, pp 13-39
Basalt from the Coast ranges of California ..... Mon XIII, pp 156-162, 245-247, 252, 280
Basalt from the island of Mitylene, Asia Minor, analysis of .... Bull 60, p 158
Basalt from volcanic necks and flows in northwestern New Mexico .. Ann 6, pp 167-182
Basalt from volcanoes of the Great basin .... Ann 2, pp 190-192
Basalt from Washoe district, Nevada .... Mon III, pp 70-71, 134
Basalt of the Eureka district, Nevada .... Mon XX, pp 242, 257-259, 386-395
Basalt of the Newark system .... Bull 85, pp 66, 77
Basalt, quartz-bearing, distribution of .... Bull 79, pp 30-33
Basalt, quartz-bearing, from Arizona .... Bull 66, p 21
Basalt, quartz-bearing, from Colorado .... Bull 66, p 22
Basalt, quartz-bearing, from the Cinder cone, northern California .. Bull 79, pp 21-30
Basalt, quartz-bearing, from the Tewan mountains, New Mexico ... Bull 66, pp 16, 20
Basaltic eruptions in Bonneville basin, Utah .... Mon I, pp 319-336
Basaltic glass of Sulphur bank, California .... Mon XIII, pp 158-162
Basalts, the occurrence of primary quartz in certain .... Bull 66
Base-levels of erosion in the Grand canyon district and elsewhere .... Ann 2, pp 101-103; Mon II, pp 76-77, 119, 224, 225

Basin range structure..........Ann 4, p 443; Mon XI, pp 24–28; Mon XX, pp 10, 211

Basins, interior, description of, their origin, destruction, etc ....Mon I, pp 2–4

Bauxite, analyses of, from various localities...................MR 1891, pp 152–154

Beaches and deltas of the glacial lake Agassiz ....Bull 39

Beaches. See, also, Shorelines.

Bear river basin, hydrography of.......Ann 11, II, pp 66–70, 102, 103; Ann 12, II, pp 325–334

Bear river beds, correlation of the ....Bull 83, pp 115–116, 135

Bear river in Wyoming, Utah, and Idaho, irrigation problems of....Ann 11, II, p 238

Becker (G. F.), administrative report for 1879–80..................Ann 1, pp 37–47

Becker (G. F.), administrative report for 1880–81..................Ann 2, pp 40–41

Becker (G. F.), administrative report for 1881–82..................Ann 3, pp 24–26

Becker (G. F.), administrative report for 1882–83..................Ann 4, pp 39–41

Becker (G. F.), administrative report for 1883–84..................Ann 5, pp 47–49

Becker (G. F.), administrative report for 1884–85..................Ann 6, pp 67–70

Becker (G. F.), administrative report for 1885–86..................Ann 7, pp 93–97

Becker (G. F.), administrative report for 1886–87..............Ann 8, I, pp 153–155

Becker (G. F.), administrative report for 1887–88..................Ann 9, pp 100–102

Becker (G. F.), administrative report for 1888–89..............Ann 10, I, pp 141–144

Becker (G. F.), administrative report for 1889–90..................Ann 11, I, pp 95–96

Becker (G. F.), administrative report for 1890–91..............Ann 12, I, pp 104–106

Becker (G. F.), administrative report on Tenth Census work.........Ann 1, pp 65–69

Becker (G. F.), geology of the Comstock lode and the Washoe district.......Ann 1, pp 71–72; Ann 2, pp 291–330; Mon III and atlas.

Becker (G. F.), geology of the quicksilver deposits of the Pacific slope.......Ann 8, II, pp 961–985; Mon XIII and atlas.

Becker (G. F.), notes on the stratigraphy of California..........................Bull 19

Belgium, coal area and output of, compared with those of other countries....MR 1882, p 5; MR 1883–84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73

Belgium, copper production of...................................MR 1882, pp 256–257

Belgium, fossil plants of, literature of the ....Ann 8, II, pp 775–777

Belgium, iron and steel production of, compared with that of other countries....................................MR 1882, p 109; MR 1883–84, p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889–90, pp 21, 22; MR 1891, p 73

Belgium, lead production of............MR 1883–84, pp 434, 438–439; MR 1885, p 264

Belgium, manganese production of ....MR 1887, p 154

Belgium, mining law of...MR 1883–84, p 998

Belgium, phosphates of ....Bull 46, pp 102–107

Belgium, zinc production of.........................MR 1882, p 357; MR 1883–84, pp 480, 488–489; MR 1885, pp 277, 280–281; MR 1886, p 159; MR 1887, p 117; MR 1888, pp 95, 96; MR 1889–90, p 92

Benjamin (M.), mineral paints, statistics of..MR 1885, pp 524–533; MR 1886, pp 702–714

Benzoic acid, compressibility of.......................................Bull 92, p 36

Bermudas, marine Mollusca, comprising the Quaternary fossils and recent forms from the ....Bull 24

Beryl from Greene county, Tennessee, analysis of.......................Bull 9, p 11

Beryl, white, from near Winslow, Maine, analysis of...................Bull 55, p 53

Bessemer pig iron, production of.......................................MR 1891, p 55

Bessemer-steel ingots and rails, production of, in the United States and Great Britain since 1877...MR 1891, p 59

Bessemer. See, also, Steel.

Bibliographies, contemplated, of special topics in North American geology..Ann 5, pp xxx–xxxi

Bibliography of Arachnida..........Bull 31, p 19
Bibliography of Dinocerata..........Mon x, pp 225–237
Bibliography of fossil insects, classed and annotated..........Bull 69
Bibliography of Insecta..........Bull 31, pp 32–34, 36–37, 46, 51, 58, 65, 85, 94, 96
Bibliography of iridium..........MR 1883–84, pp 588–591
Bibliography of irrigation in India..........Ann 12, II, pp 371–373
Bibliography of irrigation literature—a list of books, pamphlets, and articles on irrigation and allied subjects..........Ann 11, II, pp 345–388
Bibliography of marine Mollusca..........Bull 24, pp 9–17
Bibliography of Myriapoda..........Bull 31, p 9
Bibliography of Paleozoic Crustacea from 1698 to 1889..........Bull 63
Bibliography of phosphate of lime..........Bull 46, pp 129–140
Bibliography of the Archean and Algonkian rocks..........Bull 86, pp 48–50, 199–208, 220–222, 252–256, 270, 271, 342–347, 429–439, 527–529
Bibliography of the Cambrian rocks..........Bull 81, pp 22–48
Bibliography of the Cretaceous rocks of North America, annotated..Bull 82, pp 26–60
Bibliography of the Eocene formation..........Bull 83, pp 148–159
Bibliography of the Genesee, Naples, Portage, and High Point Chemung rocks of New York..........Bull 16, pp 9–12
Bibliography of the geology of North America for 1886..........Bull 44
Bibliography of the geology of North America for 1887 to 1889..........Bull 75
Bibliography of the geology of North America for 1890..........Bull 91
Bibliography of the geology of North America for 1891..........Bull 99
Bibliography of the Keweenawan rocks..........Mon v, pp 14–23, 431–432
Bibliography of the Mesozoic Echinodermata of the United States..Bull 97, pp 15–20
Bibliography of the Newark system..........Bull 85, pp 140–339
Bibliography of the Penokee district of Michigan and Wisconsin..Mon XIX, pp 5–102
Bibliography of the rocks and fossils of the Olenellus zone.....Ann 10, I, pp 516–524
Bibliography of the subaërial decay of rocks..........Bull 52, pp 57–61
Bibliography of the traps of the New Jersey region..........Bull 67, pp 74–79
Big horn mountains, Archean and Algonkian literature of the...Bull 86, pp 277–278
Bindheimite from Secret canyon, Nevada..........Bull 20, p 97
Binney (Edward William), biographical sketch of..........Ann 5, pp 374–375
Biographical sketches of paleobotanists..........Ann 5, pp 368–385
Biology and geology, interrelations of..........Ann 5, pp 363–364
Biotite, a product of mineralogical metamorphism..........Bull 62, p 212
Biotite, an alteration product of feldspar..........Ann 10, I, p 355
Biotite and quartz as alteration products of alkali feldspar......Mon XIX, pp 107, 108, 152, 336–343
Biotite, iron-, from Auburn, Maine, analysis of..........Bull 55, pp 16–17
Birds, fossil, classification of..........Ann 3, p 86
Birds, fossil, with teeth..........Ann 3, pp 45–88
Birds, origin of..........Ann 3, pp 86–87
Birkinbine (J.), American blast-furnace progress..........MR 1883–84, pp 290–311
Birkinbine (J.), iron-ore mining in 1887..........MR 1887, pp 30–57
Birkinbine (J.), iron ores, statistics of..........MR 1889–90, pp 23–47; MR 1891, pp 10–46
Birkinbine (J.), the iron ores east of the Mississippi river........MR 1886, pp 39–103
Bisilicate minerals in rocks, decomposition of..........Mon III, p 214
Bismuth, statistics of......MR 1882, p 440; MR 1883–84, pp 654–655; MR 1885, p 389
Bismuthinite from Sinaloa, Mexico, description and analysis of........Bull 90, p 40
Bituminous coal field of Pennsylvania, Ohio, and West Virginia, stratigraphy of the..........Bull 65
Bituminous. See, also, Carboniferous; Coal.
Black hills, pre-Cambrian rocks of the..........Bull 86, pp 257–261, 272, 503

Black river series, Wisconsin..Mon XIX, pp 37-38
Blair (A. A.), report on chemical work in 1879-80....................Ann 1, pp 47-48
Blake (W. P.), antimony, statistics of..........................MR 1883-84, pp 641-653
Blake (W. P.), nickel, statistics of....MR 1882, pp 399-420; MR 1883-84, pp 537-543
Blake (W. P.), quoted on glaciers of Alaska..........................Ann 5, pp 349-352
Blake (W. P.), tin, statistics of ....MR 1883-84, pp 592-640
Blast furnace, accretions formed in the..............................Mon XII, pp 725-731
Blast furnace, description of the ....Bull 25, p 22
Blast-furnace progress, American................................MR 1883-84, pp 290-311
Blast-furnace slag, utilization of.................................MR 1882, pp 161-164
Blast furnaces of Leadville, chemical discussion of the, and reactions in the....Mon XII, pp 731-745
Blue ridge, Archean and Algonkian literature of the..................Bull 86, pp 416-418
Bluestone, manufacture of, at the Lyon mill, Dayton, Nevada..MR 1882, pp 297-305
Bluestone, statistics of....MR 1882, p 297; MR 1883-84, p 951; MR 1885, pp 123, 397; MR 1886, p 683; MR 1887, pp 520-521; MR 1889-90, p 376
Bodie district, California, brief description of the....................Ann 1, pp 38-39
Bog iron ore and infusorial earth in swamps.......................Ann 10, I, pp 305-307
Bole from Table mountain, Colorado, description and analysis of...Bull 20, pp 38-39
Bolivia, copper production of.......MR 1883-84, p 356; MR 1885, p 229; MR 1886, p 128; MR 1887, p 88; MR 1888, p 73; MR 1889-90, p 73; MR 1891, p 101
Bolivia, fossil plants of, literature of the...............................Ann 8, II, p 823
Bolivia, gold and silver production of, compared with that of other countries..MR 1883-84, pp 319, 320
Bonneville, lake, contributions to the history of.......Ann 1, pp 23-25, 74-75; Ann 2, pp xvi-xvii, 167-200; Mon I
Bonneville, lake, Mulluscan fauna of..Bull 11
Bonneville, lake, sediments of, analyses of the......Ann 2, p 177; Mon I, pp 201-202
Borates and borosilicates, natural, analyses of......................Bull 55, pp 56-62
Borax, analyses of...MR 1882, p 573
Borax, statistics of......MR 1882, pp 566-577; MR 1883-84, pp 859-863; MR 1885, pp 491-493; MR 1886, pp 678-680; MR 1887, pp 4, 6, 8-9; MR 1888, pp 5, 8, 10-11; MR 1889-90, pp 494-506; MR 1891, pp 587-588
Borax lake, California, analysis of water of ....Mon XIII, p 265
Borax marsh, the Searles, San Bernardino county, California......MR 1889-90, pp 498-503
Boric acid, a method for the separation and estimation of, with an account of a convenient form of apparatus for quantitative distillations....Bull 42, pp 64-72
Borneo, antimony production of...MR 1883-84, p 649
Borneo, fossil plants of, literature of the.........................Ann 8, II, pp 806-807
Borneo, quicksilver deposits in ....Mon XIII, p 48
Borosilicates and borates, natural, analyses of ....Bull 55, pp 56-62
Bosnia, manganese-ore production of ....MR 1888, p 142; MR 1889-90, p 130
Botany and paleobotany, interdependence of.........................Ann 5, pp 366-367
Boulders resulting from external attack..............................Mon XIII, pp 68-72
Boundaries of the United States and of the several states and territories, with a historical sketch of the territorial changes ....Bull 13
Bower (A. S.), the Bower-Barff process ....MR 1882, pp 164-171
Brachiopoda; description of species of the middle Cambrian of North America..Bull 30, pp 95-123
Brachiopoda, fossil, of the Raritan clays and greensand marls of New Jersey...Mon IX, pp 5-15
Brachiopoda of the Cambrian of the Eureka district, Nevada....Mon VIII, pp 12-64
Brachiopoda of the Carboniferous of the Eureka district, Nevada....Mon VIII, pp 213-224

Brachiopoda of the Devonian of the Eureka district, Nevada...Mon VIII, pp 106-164
Brachiopoda of the lower Silurian of the Eureka district, Nevada.....Mon VIII, pp 67-76
Brachiopoda of the higher Devonian of Ontario county, New York...Bull 16, pp 24-25, 62-63
Brachiopoda of the Olenellus zone..........................Ann 10, I, pp 607-614
Brandon formation, digest of the literature of the..................Bull 83, pp 90-94
Brass, statistics of.........MR 1883-84, pp 345-347; MR 1885, pp 219, 220; MR 1886, pp 120, 121; MR 1887, pp 78, 79; MR 1888, p 63; MR 1889-90, pp 67, 68, 69
Brass used in standards of United States bureau of weights and measures, analysis of..Bull 78, p 129
Brazil, diamond mines of.......................................MR 1887, p 568
Brazil, fossil plants of, literature of the........................Ann 8, II, pp 823-824
Brazil, gold production of, compared with that of other countries......MR 1883-84, pp 319, 320
Brazil, quicksilver deposits in...................................Mon XIII, pp 23-24
Brick clay from New Ulm, Minnesota, analysis of.......................Bull 60, p 151
Brick, tile, etc., statistics of.............................MR 1882, pp 457-458; MR 1883-84, pp 679-711; MR 1885, pp 415-427; MR 1886, pp 566-580; MR 1887, pp 534-551; MR 1888, pp 557-571
Bridge-building, iron and steel, progress in......................MR 1891, pp 66-68
Bridger group of rocks, correlation of the...........Bull 83, pp 117, 123, 141-142, 146
Brine, chemistry of...Ann 7, pp 498-504
Brine, impurities of..Ann 7, pp 500-504
Brines, analyses of.......................................Ann 3, pp 226, 227; Ann 8, II, p 620; Mon I, pp 227, 253-255; Mon XI, pp 233, 234; MR 1883-84, pp 833, 845; MR 1885, p 552; MR 1887, pp 619, 630
British Columbia, Cenozoic epoch in, general considerations on the......Bull 84, pp 273-276
British Columbia, fossil plants from, literature of the...........Ann 8, II, pp 836-838
British Columbia, Neocene deposits of...........................Bull 84, pp 230-232
British Columbia. See, also, Canada.
Brochantite from Utah...Bull 55, pp 46-47
Brochantite from Yavapai county, Arizona, analysis of.................Bull 78, p 121
Bromine, statistics of..MR 1883-84, pp 851-853; MR 1885, pp 486-487; MR 1886, pp 642-643; MR 1887, pp 626-627; MR 1888, p 613; MR 1889-90, p 493; MR 1891, p 579
Bromine, chlorine, and iodine, the indirect estimation of, by the electrolysis of their silver salts, with experiments on the convertibility of the silver salts by the action of alkaline haloids......................Bull 42, pp 89-93
Brongniart (Adolphe Théodore), biographical sketch of.................Ann 5, p 372
Buck (S. M.), coal mining in the Kanawha valley of West Virginia......MR 1883-84, pp 131-143
Buffalo peaks, Colorado, geological sketch of.....................Bull 1, pp 11-17
Buhrstones, statistics of..............................MR 1882, p 477; MR 1883-84, pp 712-713; MR 1885, p 428; MR 1886, pp 581-582; MR 1887, p 552; MR 1888, p 576; MR 1889-90, p 456; MR 1891, p 552
Buhrstone, the, of South Carolina, Alabama, and Mississippi.........Bull 83, pp 51-52, 61-62, 68
Building industry in general, statistics of the.................MR 1886, pp 517-536; MR 1887, pp 503-511; MR 1888, pp 516-535
Building sand, statistics of...........MR 1883-84, pp 667-668; MR 1885, pp 404-405
Building stone, statistics of......MR 1882, pp 450-457; MR 1883-84, pp 662-667; MR 1885, pp 396-404; MR 1886, pp 536-556; MR 1887, pp 511-527; MR 1888, pp 536-544; MR 1889-90, p 374; MR 1891, pp 456-473
Bullion product, annual, of the United States and of the world.....Ann 2, pp 399-401
Bullion. See, also, Precious metals.

Bunbury (Sir Charles James Fox), biographical sketch of..............Ann 5, p 379
Burmah, fossil plants of, literature of the..........................Ann 8, II, p 793
Burmah, petroleum fields and wells of.........MR 1886, pp 480–484; MR 1888, p 474
Burnetan system of rocks of Texas.................................Bull 86, pp 267–269
Burrowing animals as soil-makers................................Ann 12, I, pp 274–287
Business organization of the United States geological survey ......Ann 8, I, pp 3–69
Butte, Montana, the mines and reduction works of....................MR 1883–84, pp 374–396; MR 1891, pp 90–99
Butterflies, known fossil, classified list of...........................Ann 8, I, p 440
Butterflies, the fossil, of Florissant, Colorado....................Ann 8, I, pp 433–474
Cache la poudre river basin, Colorado, hydrography of the......Ann 11, II, pp 44, 95
Cache lake beds of California..Bull 84, pp 201–202
Calcareous tufa. See Tufa.
Calcite from Table mountain, Colorado, occurrence and description of..Bull 20, p 39
Calcium and magnesium, separation of sodium and potassium from, by the action of amyl alcohol on the chlorides.............................Bull 42, pp 73–88
Calcium carbonate, deposition of..... ....Mon XI, p 187
Calibration of electrical pyrometers......................Bull 54, pp 84–125, 165–238
California, altitudes in...Bull 5, pp 37–54; Bull 76
California, antimony deposits in ....MR 1882, p 438; MR 1883–84, pp 641–642; MR 1885, p 387
California, asphaltum deposits and industry of....MR 1883–84, pp 938–948; MR 1888, pp 513–514; MR 1889–90, p 477; MR 1891, p 452
California; basalt from Pitt river, analysis of...........................Bull 9, p 16
California, borax deposits and statistics of............MR 1882, pp 566–567, 570–576; MR 1883–84, pp 859, 860; MR 1885, pp 491–492; MR 1886, pp 678–680; MR 1889–90, pp 494–504; MR 1891, p 587
California; borax marsh, the Searles, in San Bernardino county ....MR 1889–90, pp 498–503
California, boundary lines of, and admission of state..............Bull 13, pp 31, 129
California, building stone from, statistics of..........................MR 1882, p 451; MR 1883–84, pp 663–664; MR 1886, pp 545–546; MR 1887, pp 514, 518; MR 1888, pp 536, 538, 541, 542, 545
California; cement from South Riverside, composition of..........MR 1889–90, p 463
California, cement manufacture in......... MR 1882, p 463; MR 1883–84, pp 675–676; MR 1885, p 409; MR 1889–90, p 463; MR 1891, p 536
California, chromium from.............MR 1882, p 428; MR 1883–84, pp 569–571, 572; MR 1885, pp 357–358; MR 1886, p 176; MR 1887, p 132; MR 1888, pp 119–120
California, clay, brick, and pottery industry in.......MR 1882, p 475; MR 1883–84, pp 678, 702–704; MR 1888, pp 558, 566; MR 1891, pp 526–528
California; clays from shore of Owen's lake, analyses of................Bull 55, p 89
California, coal area and statistics of...........Ann 2, p xxviii; MR 1882, pp 90–94; MR 1883–84, pp 12, 19–24; MR 1885, pp 11, 15–18; MR 1886, pp 225, 230, 242–243; MR 1887, pp 169, 209–212; MR 1888, pp 170, 171, 225; MR 1889–90, pp 147, 178–179; MR 1891, pp 180, 212–215
California; coal from Shasta county, analysis of.....................MR 1891, p 215
California, copper statistics of..Ann 2, p xxix, MR 1882, pp 216, 226–227; MR 1883–84, pp 329, 340–341; MR 1885, p 210; MR 1886, p 112; MR 1887, pp 69, 76; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84
California, Cretaceous fossils from, new .... Bull 22
California, Cretaceous rocks of...........................Bull 82, pp 181–194, 240–241
California; dacites from Lassen's peak, analyses of.....................Bull 9, p 16
California, earthquakes in, in 1889.......................................Bull 68
California, earthquakes in, in 1890 and 1891..............................Bull 95
California, fossil Mollusca, new, from the Chico-Téjon series of.....Bull 51, pp 11–27

California, fossils from .... Ann 4, pp 291–316; Ann 8, II, pp 919–922

California, gas, natural, in .... MR 1887, pp 499–501; MR 1888, pp 509–510

California, geologic and paleontologic investigations in .... Ann 1, pp 38–39; Ann 4, pp 40–41; Ann 5, pp 31–32, 42–43, 47–48; Ann 6, pp 60, 67–70, 72–73; Ann 7, pp 94, 97–102; Ann 8, I, 153–155; Ann 9, pp 96–97, 100–101, 124; Ann 10, I, 27–28, 141–143, 145–146; Ann 11, I, pp 90–91, 95–96; Ann 12, I, pp 57, 72, 101, 104–106, 111, 116

California, geologic maps of, listed .... Bull 7, pp 122–126

California, geology of northern, notes on the .... Bull 33

California; geology of the Lassen peak district .... Ann 8, I, pp 395–432

California; geology of the quicksilver deposits of the Pacific slope .... Ann 8, II, pp 961–985; Mon XIII

California; glaciers, existing, of the United States .... Ann 5, pp 303–355

California, gold and silver statistics of .... Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; 1891, pp 75, 77, 80

California, gypsum deposits and industry of .... MR 1882, p 529; 1883–84, pp 812–813; MR 1885, p 463; MR 1886, p 623; MR 1887, p 602; MR 1889–90, p 465; MR 1891, pp 580, 581

California; halloysite from Detroit copper mine, near Mono lake, analysis of .... Bull 9, p 12

California; iron and steel from, statistics of .... MR 1882, pp 120, 125, 129, 131, 133, 135, 136, 137; MR 1883–84, pp 252, 286–287; MR 1885, pp 182, 184, 186, 197–198; MR 1886, p 18; MR 1887, p 11; MR 1888, p 15; MR 1889–90, p 12

California, irrigation in, law governing, quoted at length .... Ann 11, II, pp 242–250

California, irrigation progress and problems in .... Ann 11, II, pp 235–237

California, irrigation surveys, engineering, hydrography, segregations, etc., in .... Ann 10, II, pp viii, 58–59, 61–62, 66–67, 102–104; Ann 11, II, pp 150–168, 297–298; Ann 12, II, pp 10–54, 316–324

California; lavas from near Lassen peak, analyses of .... Bull 60, pp 155–157

California, lead deposits in .... MR 1882, p 313; MR 1883–84, p 416; MR 1885, p 248; MR 1886, p 146; MR 1887, p 104; MR 1889–90, p 80

California, lime production of .... MR 1887, p 532; MR 1888, p 555; MR 1889–90, p 383; MR 1891, p 465

California; limestone from San Benito county, analyses of .... MR 1889–90, p 383

California, manganese ore in .... MR 1885, p 349; MR 1886, pp 181, 197; MR 1888, pp 124, 128; MR 1889–90, pp 127, 131; MR 1891, pp 127, 131–132

California; marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America .... Bull 18

California, Mesozoic and Cenozoic paleontology of .... Bull 15

California; metacinnabarite from New Almaden .... Bull 78, pp 80–83

California, mineral springs of .... Bull 32, pp 202–214; MR 1883–84, p 980; MR 1885, p 537; MR 1886, p 715; MR 1887, p 683; MR 1888, p 626; MR 1889–90, p 525; MR 1891, pp 603–604

California; mineralogy of the Pacific coast, contributions to the .... Bull 61

California, minerals of, the useful .... MR 1882, pp 767–769; MR 1887, pp 703–707

California, Neocene of, summary of our knowledge of the .... Bull 84, pp 194–222

California, nickel ore in .... MR 1883–84, p 539

California; obsidian, scoriaceous, from Mono valley, analysis of .... Bull 9, p 14

California, petroleum in, localities and statistics of .... MR 1882, p 189; 1883–84, pp 218–220; MR 1885, pp 148–152; MR 1886, pp 441, 461–462; MR 1887, pp 438, 452–455; MR 1888, pp 444, 464; MR 1889–90, pp 292, 340–348; MR 1891, pp 405, 407, 432

California, precious stones found in .... MR 1883–84, pp 730–732, 763

California; Quaternary and recent Mollusca of the Great basin, with descriptions of new forms, introduced by a sketch of the Quaternary lakes of the Great basin........Bull 11
California; Quaternary history of Mono valley........Ann 8, I, pp 261–394
California, quicksilver deposits, works, and statistics of........MR 1882, pp 387–398; MR 1883–84, pp 492–496; MR 1885, pp 284–289; MR 1886, pp 160–168; MR 1887, pp 118, 120; MR 1888, pp 97, 99–100; MR 1889–90, pp 94–99; MR 1891, pp 119–121
California; quicksilver deposits of the Pacific slope..Ann 8, II, pp 961–985; Mon XIII
California; quicksilver reduction at New Almaden........MR 1883–84, pp 503–536
California, rocks from, analyses of........Bull 55, pp 84–85
California; rocks from sandstone dikes and from mount Diablo, analyses of..Bull 78 pp 123–124
California, salines and refineries in........MR 1882, pp 570–571
California; saussurite from Shasta county, analyses of........Bull 9, p 10
California, silver and gold in, comparative production of........Ann 2, p xxxvi
California, salt from, statistics of........MR 1882, pp 532–534, 547–549; MR 1883–84, pp 827, 845–847; MR 1885, pp 474, 480–483; MR 1886, pp 628, 637–638; MR 1887, pp 611, 622; MR 1888, pp 597–598, 605; MR 1889–90, pp 482, 489; MR 1891, p 572
California; soda, natural, of Mono and Owen's lakes........Bull 60, pp 53, 57–67, 75–78
California, stratigraphy of, notes on the........Bull 19
California, sulphur production of........MR 1883–84, pp 864–865
California, Téjon strata of........Bull 83, pp 100–103
California, tin ore in........MR 1883–84, pp 614–615; MR 1889–90, pp 119, 121; MR 1891, p 164
California, topographic work in...Ann 4, pp 4–6, 7–9; Ann 5, pp 13–14, 47–48; Ann 6, pp 15–16; Ann 7, pp 55–56; Ann 8, I, pp 105, 131; Ann 9, p 58; Ann 10, I, p 97; II, pp 66–67; Ann 11, II, pp 295–296; Ann 12, I, p 45
California; tourmaline from Nevada county, description and analysis of..Bull 90, p 39
California, volcanic eruption (a late one) in, and its peculiar lava........Bull 79
California; water from Matilija hot springs, near San Buenaventura, analysis of........Bull 60, p 174
California; water from Owen's lake, analysis of........Bull 55, p 93
California; waters from lakes Mono, Tahoe, and other localities in, analyses of........Bull 9, pp 26–28; Bull 42, p 149
California-Nevada, reservoir sites and irrigable lands in, reported by topographers........Ann 11, II, pp 297–298, 310
California, Oregon, and Washington, Cenozoic epoch in, general considerations on the........Bull 84, pp 269–273
Call (R. E.), Quaternary and recent Mollusca of the Great basin....Bull 11, pp 13–66
Caloosahatchie beds of Florida........Bull 84, pp 142–149
Cambrian; a correlation essay, by C. D. Walcott........Bull 81
Cambrian; classification of the early Cambrian and pre-Cambrian formations........Ann 7, pp 365–454
Cambrian; Eastern sandstone, junction between the, and the Keweenaw series of lake Superior........Bull 23
Cambrian; Eastern sandstone of the Penokee district, lake Superior........Mon XIX, pp 461–463
Cambrian fauna of the Eureka district, Nevada........Mon XX, pp 41–47, 191–192
Cambrian faunas of North America........Bull 10; Bull 30
Cambrian fossils of the Eureka district, Nevada........Mon VIII, pp 11–64, 268–269
Cambrian fossils of the Eureka district, Nevada, systematic list of........Mon XX, pp 320–321
Cambrian group, table showing classification of the........Ann 10, I, p 548
Cambrian, lower, bibliography of the rocks and fossils of the...Ann 10, I, pp 516–524

Cambrian, lower, fauna, notes on the genera and species of the .... Ann 10, I, pp 597–760

Cambrian, lower, geographic distribution of the .... Ann 10, I, pp 564–581

Cambrian, lower, review of investigations relating to the...... Ann 10, I, pp 524–547

Cambrian, lower, or Olenellus zone, fauna of the................ Ann 10, I, pp 509–763

Cambrian, lower, relations of the, to the superjacent faunas.... Ann 10, I, pp 581–597

Cambrian of the lake Superior region........................... Ann 3, pp 155–156; Mon V, pp 351–352, 366, 443; Bull 62

Cambrian rocks, enlargements in.................................. Bull 8, pp 39–41

Cambrian rocks in northeastern Iowa........................... Ann 11, I, pp 333–334

Cambrian rocks in the Leadville, Colorado, district............... Ann 2, pp 217–218

Cambrian rocks in the upper Missouri region .... Ann 6, pp 50–51

Cambrian rocks of mount Desert island, Maine................ Ann 8, II, pp 1058–1059

Cambrian rocks of North America, classification of the................. Bull 30, p 63

Cambrian rocks of Texas.. Bull 45, pp 56, 87

Cambrian rocks of the Eureka district, Nevada .... Ann 3, pp 254–259; Mon VII, pp 5–10; Mon XX, pp 34–62

Cambrian rocks of the Mosquito range, Colorado............. Mon XII, pp 58–60, 277

Cambrian strata of North America, map showing the........... Ann 10, I, pp 510–511

Cambrian time, the North American continent during.......... Ann 12, I, pp 523–568

Cambrian time, the North American continent and the continent of Europe during .... Ann 10, I, pp 556–564

Cambrian. See, also, Paleozoic.

Camden series of rocks of Arkansas................................ Bull 83, pp 74–75

Campbell (D. W.), digest of decisions relating to the use and control of water in the arid region. See p 324 of this bulletin.

Canada; Acadian area of the Newark system.................... Bull 85, pp 19–20, 80

Canada; Acadian province, the upper Paleozoic formations in the, correlations and classifications of the.......................... Bull 80, pp 226–257

Canada, antimony mines and production of .... MR 1883–84, pp 644–645

Canada, Archean and Algonkian literature of........... Bull 86, pp 209–247, 501–503

Canada, asbestus production of .... MR 1883–84, p 913; MR 1885, p 521; MR 1889–90, p 514

Canada, Cambrian rocks in, investigations of....................... Bull 81, pp 56–67, 80–88, 262–267, 285–287, 326, 334, 380, 382

Canada; coal area and output of Nova Scotia compared with those of other countries......... MR 1882, p 5; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189

Canada, coal production of.. MR 1891, p 73

Canada, copper production of.... MR 1882, p 257; MR 1883–84, pp 356, 373; MR 1885, p 229; MR 1886, p 128; MR 1887, pp 87, 97; MR 1888, p 73; MR 1891, p 101

Canada, fossil plants of, literature of the .... Ann 8, II, pp 842–848

Canada, gas, natural, in................. MR 1887, pp 501–502; MR 1891, pp 443–448

Canada, geological maps of, list of the................................ Bull 7, pp 39–51

Canada, gold production of, compared with that of other countries.... MR 1883–84, pp 319, 320

Canada; gypsum deposits of Nova Scotia......................... MR 1883–84, p 809; MR 1885, pp 459–460; MR 1887, pp 602, 603

Canada, manganese production of...... MR 1883–84, p 554; MR 1885, pp 350–356; MR 1886, p 198; MR 1887, pp 153–154; MR 1888, pp 133–136; MR 1889–90, p 130

Canada, mining law of.. MR 1883–84, p 1003

Canada; nickel ores at Sudbury .... MR 1888, pp 110–117

Canada, nickel production of.................................. MR 1882, pp 402, 403; MR 1888, pp 110–116; MR 1889–90, p 125; MR 1891, pp 167, 168

Canada, petroleum production of...... MR 1887, pp 456–458; MR 1888, pp 443, 467–473

Canada, phosphate deposits of.. Bull 46, pp 23–42

Canada, pyrites production of.................................MR 1883–84, p 881; MR 1885, pp 506–507; MR 1886, p 656

Canada; rocks from Kakabikka falls, Kaministiquia river, Ontario, analyses of.................................Bull 42, p 139

Canada and the northwest territories, elevations in....................Bull 6; Bull 72

Canada. See, also, British Columbia; Newfoundland.

Canal lines to divert water from Snake river in Idaho.........Ann 11, II, pp 190–200

Canals. See, also, Irrigation.

Cancrinite, from Litchfield, Maine, analysis of....................Bull 42, pp 29–30

Canyon. See Grand canyon.

Canyons traversing the upthrusts and folds of the Uinta and Park ranges...Ann 9, pp 706–712

Cape Ann, Massachusetts, geology of..........................Ann 9, pp 529–611

Caprinic acid, compressibility and thermal expansion of...............Bull 92, p 35

Carbon in steel...Bull 25, p 12

Carbonate of lime, deposition of.............................Ann 9, pp 640–645

Carbonate of lime, solution of, in natural waters......................Ann 9, p 637

Carbonate of soda, analyses of..........................MR 1882, pp 601, 602

Carbonate ores, analysis of.......................................Mon XII, p 544

Carboniferous age of peridotite in Kentucky....................Bull 38, pp 28–29

Carboniferous basins of southwestern Missouri, flora of the....................Bull 98

Carboniferous; Coal measures or Pennsylvania series; the development of its nomenclature and classification in the Appalachian provinces........Bull 80, pp 83–107

Carboniferous; comparative stratigraphy of the bituminous coal field of the northern half of the Appalachian field....................................Bull 65

Carboniferous fauna of the Eureka district, Nevada.......................Mon XX, pp 86–91, 94–95, 96, 98, 171, 194, 199

Carboniferous fossils of the Eureka district, Nevada...Mon VIII, pp 212–267, 279–281

Carboniferous fossils of the Eureka district, Nevada, systematic list of....Mon XX, pp 330–333

Carboniferous limestone of northern California, character and distribution of the..Bull 33, pp 10–12

Carboniferous nonconformity in the Gunnison region of Colorado..Ann 6, pp 65–66

Carboniferous; nonmarine fossil Mollusca of North America......Ann 3, pp 411–486

Carboniferous Ostreidæ of North America................................Ann 4, p 288

Carboniferous; Permian of Kansas and Nebraska and other parts of the United States, discussions relative to the correlation of the..........Bull 80, pp 193–212

Carboniferous; Permian of Texas and its Mesozoic types of fossils..........Bull 77

Carboniferous; Permian of the Grand canyon district..........Ann 2, pp 64, 91–94; Mon II, pp 16, 43–46, 117–121

Carboniferous; Permian of the Plateau country..........Ann 6, pp 134–135, 184–185

Carboniferous rocks containing bitumen deposits.....Ann 11, I, pp 598–599, 638–639

Carboniferous rocks in California...............................Bull 19, pp 21–23

Carboniferous rocks in the Leadville, Colorado, district..........Ann 2, pp 218–220

Carboniferous rocks in the region of the Uinta mountains........Ann 9, pp 687–688

Carboniferous rocks in the upper Missouri region....................Ann 6, pp 51–52

Carboniferous rocks of Lassen peak district, Colorado..........Ann 8, II, pp 404–405

Carboniferous rocks of northeastern Iowa.......................Ann 11, I, pp 308–313

Carboniferous rocks of Texas...................................Bull 45, pp 56–62

Carboniferous rocks of the Eureka district, Nevada...............Ann 3, pp 268–272; Mon XX, pp 63–98

Carboniferous rocks of the Grand canyon district....................Ann 2, pp 64–66; Mon II, pp 18, 87–89, 178–179

Carboniferous rocks of the Mosquito range, Colorado..........Mon xii, pp 63–70, 278
Carboniferous strata of southwestern Kansas.................Bull 57, pp 13, 19–20
Carboniferous strata of the Plateau country...........Ann 6, pp 132–133, 159–162, 184
Carboniferous system, fishes of the..........................Mon xvi, pp 75–228
Carboniferous and Devonian, a correlation essay, by H. S. Williams.........Bull 80
Carboniferous and Devonian formations of the Eureka district, Nevada.........Mon xx, pp 63–98
Carboniferous. See, also, Paleozoic.
Carburets, iron, electrical and magnetic properties of the..Bull 14; Bull 27, pp 30–50
Carburets, iron, physical characteristics of the..............Ann 4, pp 53–59; Bull 35
Carll (J. F.), quoted on natural gas in Pennsylvania.............MR 1887, pp 467–474
Carruthers (William), biographical sketch of......................Ann 5, pp 384–385
Carson river and valley, Nevada, irrigation surveys of..........Ann 11, ii, pp 179–180
Carson river basin, hydrography of.. ..Ann 11, ii, pp 65–66, 102, 109; Ann 12, ii, p 325
Cartographic system for geologic maps...........................Ann 7, pp 104–106
Cartography, geologic, color scheme for.........................Ann 2, pp xlix–lii
Cartography, geologic, conference on, and standards adopted.....Ann 10, i, pp 56–79
Cascade and Coast ranges, structure of the.........................Ann 7, pp 98–102
Cascade, Coast and Sierra nevada ranges, relation of the............... Bull 19, p 20; Bull 33, pp 19–20
Cascade mountains, geological examination of the...............Ann 8, i, pp 159–164
Cascade mountains, structure of the...........................Mon xiii, pp 205–207
Cascade mountains. See, also, Oregon; Washington.
Cassiterite from veins in the Black hills, Dakota, and other localities, analyses of...MR 1888, pp 153, 154
Catalogue, annotated and illustrated, of nonmarine Mollusca of North America...Ann 3, pp 420–550
Catalogue. See Bibliography.
Catlett (C.), native gold from Persia, analysis of.....................Bull 60, p 137
Catlett (C.), pyroxene and serpentine from Montville, New Jersey, analyses of..Bull 60, p 137
Catlett (C.) and Clarke (F. W.), a platiniferous nickel ore from Canada....Bull 64, pp 20–21
Caverns or sink-holes formed by the action of soil water.............Ann 12, i, p 257
Caves in limestone found in connection with ore bodies....Mon vii, pp 73–74, 94–100
Caves, theory of formation of.....................................Mon vii, pp 94, 189
Cement, ancient Mexican, analysis of..............................Bull 27, p 72
Cement from South Riverside, California, composition of...........MR 1889–90, p 463
Cement, Portland, industry in America, history of the............MR 1891, pp 535–537
Cement, statistics of.......MR 1882, pp 459–464; MR 1883–84, pp 671–676; MR 1885, pp 405–409; MR 1886, pp 556–564; MR 1887, pp 527–532; MR 1888, pp 551–554; MR 1889–90, pp 461–464; MR 1891, pp 529–538
Cements, analyses of.............MR 1882, p 460; MR 1883–84, p 676; MR 1887, p 531
Cenozoic beds and formations of the United States, excluding the Laramie, list of names applied to the...............................Bull 84, pp 320–336
Cenozoic epoch on the Pacific coast of North America, general considerations on the...Bull 84, pp 269–273
Cenozoic formations, classification of the...........................Bull 83; Bull 84
Cenozoic and Mesozoic paleontology of California..........................Bull 15
Cenozoic. See, also, Eocene; Neocene; Tertiary.
Central America, geological map of a portion of, described ....Bull 7, p 149
Cephalopoda from the Carboniferous of the Eureka district, Nevada......Mon viii, pp 265–266
Cephalopoda from the Cretaceous of Arkansas......................Bull 4, pp 16–17
Cephalopoda from the Devonian of the Eureka district, Nevada..Mon viii, pp 200–204

Cephalopoda from the higher Devonian of Ontario county, New York ......Bull 16, pp 20-22, 47-52
Cephalopoda from the lower Silurian of the Eureka district, Nevada......Mon VIII, pp 86-88
Cephalopoda of the Eocene ....Bull 83
Cephalopoda and Gasteropoda of the Raritan clays and greensand marls of New Jersey ....Mon XVIII
Cephalopods and gasteropods from the New Jersey Cretaceous recognized at other localities, table showing ....Mon XVIII, p 30
Cessions and purchases, territory of the United States acquired by..Bull 13, pp 19-32
Ceylon, graphite mining in ....MR 1891, p 589
Chabazite from Table mountain, Colorado, general description and chemical composition of...Bull 20, pp 23-24
Chalcophyllite from Utah.......................................Bull 55, p 43
Chalks, statistics of................................MR 1883-84, pp 930-932
Chama district, New Mexico, irrigation in the ....Ann 12, II, pp 261-269
Chamber dust, analysis and composition of.....................Mon XII, pp 711-717
Chamberlin (T. C.), administrative report for 1881-82................Ann 3, pp 17-21
Chamberlin (T. C.), administrative report for 1882-83................Ann 4, pp 23-27
Chamberlin (T. C.), administrative report for 1883-84................Ann 5, pp 20-24
Chamberlin (T. C.), administrative report for 1884-85................Ann 6, pp 33-40
Chamberlin (T. C.), administrative report for 1885-86................Ann 7, pp 76-85
Chamberlin (T. C.), administrative report for 1886-87............Ann 8, I, pp 141-144
Chamberlin (T. C.), administrative report for 1887-88................Ann 9, pp 84-87
Chamberlin (T. C.), administrative report for 1888-89............Ann 10, I, pp 128-129
Chamberlin (T. C.), administrative report for 1889-90..............Ann 11, I, pp 74-76
Chamberlin (T. C.), administrative report for 1890-91..............Ann 12, I, pp 88-90
Chamberlin (T. C.), conditions of artesian wells..................Ann 5, pp 125-173
Chamberlin (T. C.), introduction to Wright's "Glacial boundary"..Bull 58, pp 13-38
Chamberlin (T. C.), rock-scorings of the great ice invasions.......Ann 7, pp 147-248
Chamberlin (T. C.), terminal moraine of the second glacial epoch..Ann 3, pp 291-402
Chamberlin (T. C.) and Irving (R. D.), observations on the junction between the Eastern sandstone and the Keweenaw series on Keweenaw point, lake Superior ....Bull 23
Chamberlin (T. C.) and Salisbury (R. D.), driftless area of the upper Mississippi valley...Ann 6, pp 199-322
Chance (H. M.), anthracite coal mining.....................MR 1883-84, pp 104-131
Chance (H. M.), Choctaw coal fields, Indian territory, description of the...MR 1889-90, pp 207-214
Charcoal and coals from Montana, analyses of...............MR 1889-90, pp 229, 230
Charleston earthquake of August 31, 1886..........................Ann 9, pp 203-528
Chatard (T. M.), an apparatus for the determination of water in mineral analyses...Bull 78, pp 84-86
Chatard (T. M.), corundum and emery ....MR 1883-84, pp 714-720
Chatard (T. M.), estimation of alkalies in silicates ....Bull 9, pp 36-37
Chatard (T. M.), natural soda, its occurrence and utilization......Bull 60, pp 27-101
Chatard (T. M.), salt-making processes in the United States ......Ann 7, pp 491-535
Chatard (T. M.), the gneiss dunyte contacts of Corundum hill, North Carolina, in relation to the origin of corundum ....Bull 42, pp 45-63
Chatard (T. M.), the separation of titanium, chromium, aluminum, iron, barium, and phosphoric acid in rock analyses ....Bull 78, pp 87-90
Chatard (T. M.) and Clarke (F. W.), mineral, rock, ore, and water analyses..Bull 9, pp 9-35
Chattahoochee group of rocks of Georgia and Florida........Bull 84, pp 83, 105-107
Chemical action between solids ....Bull 64, pp 34-37

Chemical alteration of rocks .... Bull 52, p 37
Chemical analyses and composition. See the various substances.
Chemical and geological evidence of the identity of rocks of Washoe, Nevada, of different degrees of crystallization .... Bull 17, pp 29–39
Chemical and physical effect of sudden cooling of glass .... Bull 42, pp 98–131
Chemical deposits of Mono lake, California .... Ann 8, I, pp 296–298, 310–315
Chemical effect of precipitants .... Bull 36, p 24
Chemical effect of temperature in subsidence of fine solid particles in liquids .. Bull 36, pp 20–21
Chemical elements, the relative abundance of the .... Bull 78, pp 34–42
Chemical equilibrium of solids, in its relation to pressure and to temperature .... Bull 94, pp 109–135
Chemical evidence of the origin of fayalite and lithophysæ .... Ann 7, pp 282–283
Chemical history of lake Lahontan .... Ann 3, pp 211–215; Mon XI, pp 172–237
Chemical history of the Comstock lode, Nevada .... Ann 2, pp 307–310
Chemical impregnation of artesian water .... Ann 5, pp 165–167
Chemical metamorphism of the Menominee and Marquette rocks .. Bull 62, pp 208–217
Chemical origin of petroleum and natural gas .... Ann 8, II, pp 486–487
Chemical properties of lead slags .... MR 1883–84, pp 447–453
Chemical reactions in copper smelting .... Bull 26, pp 53–54, 61–62, 64–66
Chemical relations of gabbro and diorite .... Bull 28, pp 37–39
Chemical structure of natural silicates .... Bull 60, pp 13–20
Chemical tests of steel .... Bull 25, pp 72–75
Chemistry of the Comstock lode .... Mon III, pp 209–227, 384–387
Chemistry of the rocks and ores of Leadville, Colorado .... Mon XII, pp 585–608
Chemistry, work in, during 1883–84 .... Ann 5, pp 59–62; Bull 9
Chemistry and physics, work in, during 1884–85 .... Ann 6, pp 86–88; Bull 27
Chemistry and physics, work in, during 1885–86 .... Ann 7, pp 127–130; Bull 42
Chemistry and physics, work in, during 1886–87 .... Ann 8, I, pp 189–193; Bull 55
Chemistry and physics, work in, during 1887–88 .... Ann 9, pp 141–143; Bull 60
Chemistry and physics, work in, during 1888–89 .... Ann 10, I, pp 177–181; Bull 64
Chemistry and physics, work in, during 1889–90 ...... Ann 11, I, pp 125–127; Bull 78
Chemistry and physics, work in, during 1890–91 ...... Ann 12, I, pp 127–129; Bull 90
Chemung-Catskill formations, history of the discussions concerning the correlation of the .... Bull 80, pp 121–134
Chenevixite from Tintic mining district, Utah .... Bull 20, pp 85–86
Chert in limestone of the Penokee series, origin of .... Ann 10, I, pp 367–369
Cherty iron carbonates, action of water in the formation of .... Ann 10, I, p 395
Cherty limestone of Penokee iron-bearing series, petrographical character, origin, etc ... Ann 10, I, pp 365–369, 446, 472, 480–490; Mon XIX, pp 127–142, 443–455
Chesapeake bay, geology of the head of .... Ann 7, pp 537–646
Chesapeake formation of Maryland, North Carolina, and Florida ...... Ann 12, I, pp 410–412; Bull 84, pp 54, 68, 123–126
Chester (F. D.), the gabbros and associated rocks in Delaware .... Bull 59
Chico-tejon series .... Ann 6, pp 68–70, 73; Bull 15, pp 11–17; Bull 19, pp 14, 17; Bull 83, pp 100–110
Chico-tejon series in Oregon and Washington, equivalents of the .... Bull 51, pp 28–32
Chico-tejon series of California, new fossil Mollusca from the .... Bull 51, pp 11–27
Chico-tejon. See, also, Cretaceous; Eocene.
Chile, copper production of .... MR 1882, pp 252–253; MR 1883–84, pp 356, 363; MR 1885, pp 229, 234; MR 1886, pp 128, 132–133, MR 1887, pp 88, 92–93; MR 1888, p 73; MR 1889–90, p 73; MR 1891, pp 101, 102
Chile, fossil plants of, literature of the .... Ann 8, II, pp 820–821
Chile, geological maps of, list of the .... Bull 7, pp 156, 157
Chile, gold and silver production of, compared with that of other countries ..... MR 1883–84, pp 319, 320

Chile, iodine production of .... MR 1883–84, pp 857–858; MR 1885, p 488

Chile, manganese production of .... MR 1886, p 206; MR 1888, p 139; MR 1889–90, p 130; MR 1891, pp 138–141

Chile, meteorites from, description and analysis of .... Bull 78, pp 95, 97

Chile, quicksilver deposits in .... Mon xiii, p 23

China, Cambrian rocks of .... Bull 81, p 377

China, fossil plants of, literature of the .... Ann 8, ii, pp 790–792

China, gas, natural, statistics of .... MR 1891, pp 448–451

China, porcelain clays from, analyses of .... Bull 27, pp 71–72

China, quicksilver mines of .... Ann 8, ii, pp 965–966; Mon xiii, pp 4, 6, 14, 46

China, tin production of .... MR 1883–84, p 623

Chisolm (F. F.), Dakota coal .... MR 1888, p 240

Chisolm (F. F.), iron in the Rocky mountain division .... MR 1883–84, pp 281–286; MR 1885, p 196; MR 1887, pp 28–29; MR 1888, pp 33–35

Chisolm (F. F.), Wyoming coal .... MR 1888, pp 390–394

Chlorhydric acid, aqueous, coefficients of volatility for .... Bull 60, pp 115–117

Chlorine, bromine, and iodine, the indirect estimation of, by the electrolysis of their silver salts, with experiments on the convertibility of the silver salts by the action of alkaline haloid .... Bull 42, pp 89–93

Chlorine in dolomites of the Mosquito range, Colorado .... Mon xii, p 279

Chlorite as a product of weathering .... Bull 62, p 213

Chlorite, formation of, in Comstock lode, Nevada .... Mon iii, p 211

Chlorite, formation of, in decomposition of rocks .... Mon iii, pp 72, 210, 384

Chlorites, micas, and vermiculites, on the constitution of certain .... Bull 90, pp 11–21

Chloritization, a kind of mineralogical metamorphism .... Bull 62, p 55

Chondrodite from Iowa, description and analysis of .... Bull 78, pp 95–97

Christy (S. B.), quicksilver reduction at New Almaden .... MR 1883–84, pp 503–534

Chrome iron ore, statistics of .... MR 1891, pp 171–173

Chromium, foreign sources of .... MR 1883–84, p 571

Chromium, separation of, in rock analyses .... Bull 78, pp 87–90

Chromium, statistics of .... MR 1882, pp 428–430; MR 1883–84, pp 567–573; MR 1885, pp 357–360; MR 1886, pp 176–179; MR 1887, pp 132–133; MR 1888, pp 119–122; MR 1889–90, pp 137–140

Chryohydrates in relation to rock magmas .... Bull 66, p 27

Chuar group of rocks of Arizona .... Bull 86, pp 329–332

Church (J. A.), quoted on the Comstock lode, Nevada .... Mon iii, pp 28–31

Cimolite from Norway, Maine, analysis of .... Bull 9, p 12

Cincinnati ice-dam .... Bull 58, pp 17–38, 76–101

Cinnabar and hot springs, association of .... Mon xiii, p 403

Cinnabar and other ores, solution and precipitation of .... Mon xiii, pp 269–270, 419–437, 473–474

Cinnabar crystals from California .... Bull 61, pp 11–22

Cinnabar deposits of the Pacific slope and elsewhere .... Mon xiii

Cinnabar, distribution of .... Mon xiii, pp 50–52

Cinnabar in British Columbia .... Mon xiii, p 384

Cinnabar in the Great basin .... Mon xiii, p 385

Cinnabar, mineral association of .... Mon xiii, p 52

Cinnabar, pyrite, and gold of the quicksilver mines of the Pacific slope, origin of the .... Mon xiii, pp 438–450, 475

Cinnabar, solubility of, in ammoniacal solutions .... Mon xiii, pp 269–270

Cinnabar, solution and precipitation of .... Mon xiii, pp 419–437

Cinnabar. See, also, Quicksilver.

Claiborne formation of Alabama and Mississippi .... Bull 83, pp 62–64, 68

Claiborne-Meridian deposits .... Ann 12, i, pp 413–415

Clark (F. A.), report on Eureka topographical survey .... Ann 1, p 36

Clark (W. B.), a correlation essay—Eocene.................................Bull 83
Clark (W. B.), the Mesozoic Echinodermata of the United States...........Bull 97
Clarke (F. W.), a new occurrence of gyrolite......................Bull 64, pp 22–23
Clarke (F. W.), a theory of the mica group.........................Bull 64, pp 9–19
Clarke (F. W.), administrative report for 1883–84..............Ann 5, pp. 59–62
Clarke (F. W.), administrative report for 1884–85.................Ann 6, pp 86–88
Clarke (F. W.), administrative report for 1885–86................Ann 7, pp 127–130
Clarke (F. W.), administrative report for 1886–87...............Ann 8, I, pp 189–193
Clarke (F. W.), administrative report for 1887–88.................Ann 9, pp 141–143
Clarke (F. W.), administrative report for 1888–89..............Ann 10, I, pp 177–181
Clarke (F. W.), administrative report for 1889–90..............Ann 11, I, pp 125–127
Clarke (F. W.), administrative report for 1890–91..............Ann 12, I, pp 127–129
Clarke (F. W.), analyses of jade.....................................Bull 60, 123–127
Clarke (F. W.), chemistry and physics, report of work in, during 1884–85....Ann 6, pp 86–88; Bull 27
Clarke (F. W.), chemistry and physics, report of work in, during 1885–86....Ann 7, pp 127–130; Bull 42
Clarke (F. W.), chemistry and physics, report of work in, during 1886–87....Ann 8, I, pp 189–193; Bull 55
Clarke (F. W.), chemistry and physics, report of work in, during 1887–88....Ann 9, pp 141–143; Bull 60
Clarke (F. W.), chemistry and physics, report of work in, during 1888–89...Ann 10, I, pp 177–181; Bull 64
Clarke (F. W.), chemistry and physics, report of work in, during 1889–90...Ann 11, I, pp 125–127; Bull 78
Clarke (F. W.), chemistry and physics, report of work in, during 1890–91...Ann 12, I, pp 127–129; Bull 90
Clarke (F. W.), iridium, statistics of..............................MR 1882, p 444
Clarke (F. W.), mica, statistics of..........................MR 1883–84, pp 906–912
Clarke (F. W.), minerals of Litchfield, Maine......................Bull 42, pp 28–38
Clarke (F. W.), oligoclase from Bakersville, North Carolina......Bull 60, pp 129–130
Clarke (F. W.), petatite from Peru, Maine..........................Bull 60, p 129
Clarke (F. W.), researches on the lithia micas.....................Bull 42, pp 11–27
Clarke (F. W.), some nickel ores from Oregon.......................Bull 60, pp 21–26
Clarke (F. W.), spessartite from Amelia county, Virginia..............Bull 60, p 129
Clarke (F. W.), studies in the mica group..........................Bull 55, pp 13–18
Clarke (F. W.), the chemical structure of the natural silicates.....Bull 60, pp 13–20
Clarke (F. W.), the relative abundance of the chemical elements..Bull 78, pp 34–42
Clarke (F. W.), topaz from Stoneham, Maine..........................Bull 27, pp 9–15
Clarke (F. W.), willemite from the Trotter mine, Franklin, New Jersey..Bull 60, p 130
Clarke (F. W.) and Catlett (C.), a platiniferous nickel ore from Canada.........Bull 64, pp 20–21
Clarke (F. W.) and Chatard (T. M.), mineral, rock, ore, and water analyses....Bull 9, pp 9–35
Clarke (F. W.) and Diller (J. S.), turquoise from New Mexico......Bull 42, pp 39–44
Clarke (F. W.) and Schneider (E. A.), experiments upon the constitution of the natural silicates.......................................Bull 78, pp 11–33
Clarke (F. W.) and Schneider (E. A), on the constitution of certain micas, vermiculites, and chlorites..............................Bull 90, pp 11–21
Clarke (J. M.), the higher Devonian faunas of Ontario county, New York....Bull 16
Classification and nomenclature of fossil plants..................Ann 5, pp 425–439
Classification, natural method of, as indicated by paleobotany....Ann 5, pp 431–452
Classification of clays, commercial and natural..................MR 1891, pp 476–484
Classification of drainage basins...............................Ann 12, II, pp 232–234
Classification of early Cambrian and pre-Cambrian...............Ann 7, pp 365–454

Classification of formations by paleontological and lithological characteristics and by unconformity........Ann 7, pp 371–448
Classification of formations. See, also, Correlation.
Classification of geology........Ann 11, I, pp 238–242
Classification of igneous rocks........Ann 12, I, pp 660–663
Classification of the cryptogams........Ann 5, pp 437–439
Classification of the lavas of the Eureka district, Nevada........Mon XX, p 233
Classification of topographic forms by hydrography........Ann 7, pp 558–564
Clay, lacustral, analyses of........Ann 8, I, p 307
Clay, sand, etc., from Martha's vineyard, Mass., analyses of........Bull 55, pp 89–90
Clay, yellow, of lake Bonneville........Mon I, pp 200–203
Clays, analyses of........MR 1882, pp 469, 472–474; MR 1883–84, pp 678, 975
Clays, classification of, commercial and natural........MR 1891, pp 476–484
Clays, fire, analyses of........MR 1882, pp 468, 469, 473, 474; MR 1888, p 569
Clays from Florida, analyses of........Bull 90, p 74
Clays from Henry county, Illinois, analyses of........Bull 27, pp 66–67
Clays from Mill city, Nevada, analyses of........Bull 9, p 15
Clays from shore of Owen's lake, California, analyses of........Bull 55, p 89
Clays, glacial, from Milwaukee, Wisconsin, analyses of........Ann 6, p 250
Clays not essentially kaolin........Mon III, p 217
Clays, porcelain, from China, analyses of........Bull 27, pp 71–72
Clays, pottery, analyses of........MR 1882, p 472; MR 1883–84, p 690
Clays, Raritan, and greensand marls of New Jersey, Brachiopoda and Lamellibranchiata, and Gasteropoda and Cephalopoda, of the...Mon IX; Mon XVIII
Clays, residual, characteristics of........Bull 52, p 39
Clays, residuary, from Wisconsin, analyses of........Ann 6, p 250; Bull 27, pp 67–68
Clays, sedimentary, of the geological formations in sequence....MR 1891, pp 490–500
Clays, statistics of........MR 1882, pp 465–475; MR 1883–84, pp 676–711; MR 1885, p 414; MR 1886, pp 569–578; MR 1887, pp 540–549; MR 1888, pp 569–574; MR 1889–90, pp 441–444; MR 1891, pp 474–528
Clear lake, California, surveyed for reservoir site........Ann 11, II, pp 150–154
Clerc (F. L.), the mining and metallurgy of zinc in the United States.....MR 1882, pp 358–386
Cliff talus soils........Ann 12, I, pp 232–236
Cliffs of various kinds........Ann 5, pp 112–115; Mon I, pp 75–77
Cliffs, recession of........Ann 2, p 58; Mon II, pp 250–260
Climate and interior basins........Ann 2, pp 173–174; Mon I, pp 3–4
Climate, arid, of the Great basin, causes of the....Ann 3, pp 199–201; Mon I, pp 6–10
Climate; depauperation of shells in relation to temperature........Bull 11, pp 38–41
Climate; direction of Pleistocene winds in the Bonneville basin........Mon I, p 332
Climate in relation to oscillations of the surface of Great salt lake........Mon I, pp 238–239, 244–250
Climate in relation to rock decay........Bull 52, pp 30–34
Climate in relation to the deformation of the Bonneville basin........Mon I, pp 377–378, 425–427
Climate in relation to the driftless area........Ann 6, p 322
Climate interpreted by lake oscillations........Mon I, pp 262–318
Climate of the Eureka district, Nevada, in geologic time........Mon XX, p 5
Climate of the Newark epoch........Bull 85, pp 47–53
Climate, Pleistocene, as revealed by the lake Lahontan records........Ann 3, pp 230–232; Mon XI, pp 254–268
Climate, Pleistocene, in relation to the rise and fall of the surface of lake Bonneville........Ann 2, pp 186–187; Mon I, pp 265–297, 317–318
Climate, Pleistocene, of Mono basin, California........Ann 8, I, pp 390–393
Climate; relation of alluvial cones to aridity........Mon I, pp 220–221

Climates, geologic, of the Grand canyon district ....Mon II, pp 99–100, 189–191, 196, 222–229
Climatic changes in the Great basin ....Ann 4, pp 456–457, 463–464
Climatic conditions affecting barometric hypsometry..........................Ann 2, pp 409–429, 521–534, 562–565
Clinoclasite from Utah..Bull 55, pp 43–45
Coal, analysis of, from Alaska, Cook's inlet..............................MR 1891, p 210
Coal, analysis of, from Arizona, Deer creek valley ....Bull 27, p 74
Coal, analysis of, from Arkansas, many localities...............................MR 1888, pp 222–223; MR 1889–90, p 176
Coal, analysis of, from California, Shasta county ....MR 1891, p 215
Coal, analysis of, from Colorado, various localities...................................Bull 64, pp 55–57; MR 1889–90, pp 181, 182, 186, 187, 188
Coal, analysis of, from Indian territory, Choctaw fields.......MR 1889–90, pp 207–214
Coal, analysis of, from Massachusetts, Martha's vineyard................ Bull 55, p 87
Coal, analysis of, from New Mexico, Lincoln and Santa Fé counties......MR 1889–90, pp 232, 233
Coal, analysis of, from North Carolina, Gulf, Walnut cove, and Farmville....Bull 42, p 146; Bull 85, p 37
Coal, analysis of, from Rhode Island, Cranston ....Bull 9, p 18
Coal, analysis of, from Texas, Burnet county............................Bull 55, p 87
Coal, analysis of, from Utah, near Salt lake city............................Bull 90, p 75
Coal, analysis of, from Virginia, various localities ....Bull 55, p 87; Bull 85, p 37
Coal, analysis of, from West Virginia, Barbour, Jefferson, and Randolph counties..........................Bull 78, p 128; Bull 42, p 146; Bull 27, pp 73–74
Coal and charcoal, analysis of, from Montana................MR 1889–90, pp 229, 230
Coal and coke, analysis of, from Tennessee ....Bull 64, pp 54–55
Coal and coke, analysis of, from West Virginia ....Bull 60, p 169; Bull 64, p 54; Bull 90, p 75
Coal area and output of the world, by countries.......................MR 1882, p 5; MR 1883–84, p 13; MR 1885, pp 11–12; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1889–90, p 22; MR 1891, p 73
Coal-bearing strata of Virginia..Mon VI, pp 1–9
Coal field, the bituminous, of Pennsylvania, Ohio, and West Virginia, stratigraphy of ....Bull 65
Coal fields in Pennsylvania, description and production of the anthracite..MR 1882, pp 7–24
Coal fields in the arid region of the United States ....Ann 11, II, pp 208–209
Coal fields of the United States, area and classification of the......MR 1882, pp 4–5; MR 1888, pp 168–170; MR 1889–90, pp 146–147; MR 1891, pp 178–179
Coal in the great Sioux reservation, Dakota ....Bull 21
Coal measures of cape Beaufort ....Bull 84, p 249
Coal measures of Indian territory, columnar section of the ....MR 1889–90, p 212
Coal measures or Pennsylvanian series; the development of its nomenclature and classification in the Appalachian province.............Bull 80, pp 83–107
Coal mines of the United States, wages and labor at the ...MR 1889–90, pp 169–171; MR 1891, pp 203, 204
Coal mining, anthracite ....MR 1883–84, pp 104–131
Coal mining in the Kanawha valley of West Virginia........MR 1883–84, pp 131–143
Coal mining industry, general view of the ....MR 1882, pp 1–7
Coal of Carboniferous age at Eureka, Nevada.......................Mon XX, pp 95–98
Coal of the Newark system...Bull 85, pp 36–43
Coal, statistics of ....Ann 1, pp 72–73; Ann 2, pp xxvi–xxxi; MR 1882, pp 1–107; MR 1883–84, pp 11–213; MR 1885, pp 10–73; MR 1886, pp 224–377; MR 1887, pp 168–382; MR 1888, pp 168–394; MR 1889–90, pp 145–286; MR 1891, pp 177–356

Coal. See, also, Lignite.

Coals of Utah, analyses and calorific values of some................MR 1882, pp 76–81

Coast and Cascade ranges, structure of the........................Ann 7, pp 98–102

Coast, Cascade, and Sierra nevada ranges, relation of the ....Bull 19, p 20; Bull 33, pp 19–20

Coast ranges of California, metamorphic rocks of the ....Bull 19, pp 7–12

Coast ranges, stratigraphy of the..............................Bull 84, pp 200–217

Coast ranges. See, also, California; Oregon.

Coastal group of rocks of New Brunswick ....Bull 86, pp 232–238

Coastal plain, configuration and general geology of the ....Ann 7, pp 548–550; Ann 12, I, pp 360–429

Coasts, special topography of...................................Ann 2, pp 171–172; Mon I, pp 23–170; Mon XI, pp 87–124

Cobalt, statistics of ....MR 1882, pp 421–423; MR 1883–84, pp 544–549; MR 1885, pp 361–365; MR 1886, pp 174–175; MR 1887, pp 130–131; MR 1888, pp 108, 620–621; MR 1889–90, pp 124–126; MR 1891, pp 169–170

Cobalt ore, analyses of...............MR 1883–84, pp 544, 545; MR 1885, pp 361, 362

Coke, natural, from Carbonhill and Midlothian, Virginia, analyses of.....Bull 42, p 146; Bull 85, p 37

Coke, natural, from Purgatory canyon, New Mexico, analysis of.......Bull 42, p 147

Coke, natural, of Virginia.......................................Bull 85, p 37

Coke, statistics of the manufacture of....................MR 1882, pp 48, 72, 98–101; MR 1883–84, pp 144–213; MR 1885, pp 74–129; MR 1886, pp 378–438; MR 1887, pp 383–435; MR 1888, pp 395–441; MR 1891, pp 357–402

Coking in Europe and other countries....MR 1886, pp 430–437; MR 1887, pp 432–435

Cold brook group of rocks of New Brunswick..................Bull 86, pp 230–238

Colloidal sulphides of gold.....................................Bull 90, pp 56–61

Colombia, gold and silver production of, compared with that of other countries...MR 1883–84, pp 319, 320

Color effect produced by slow oxidation of iron carbonates........Bull 35, pp 51–60

Color, temper-value, and time of exposure, the relation between, in oxide films on steel ....Bull 27, pp 51–61

Color scheme for geologic cartography...........................Ann 2, pp xlix–lii; Ann 7, p 105; Ann 10, I, pp 69–79

Colorado, altitudes in.................................Bull 5, pp 55–70; Bull 76

Colorado, Arkansas river in, surveys for reservoir sites along the.........Ann 11, II, pp 133–144

Colorado; artesian water in the Denver basin.....................Ann 11, II, p 262

Colorado; astrophyllite from El Paso county, analysis of.............Bull 78, p 119

Colorado, boundary lines of, and admission of territory ....Bull 13, pp 32, 123

Colorado; Buffalo peaks, geological sketch of ....Bull 1, pp 11–17

Colorado, building stone from, statistics of..........................MR 1882, p 451; MR 1883–84, p 674; MR 1886, pp 538, 544; MR 1887, p 521; MR 1888, p 544; MR 1889–90, pp 374, 383–385; MR 1891, pp 457, 458, 461, 464, 465

Colorado, Cambrian rocks in, correlation of....Bull 81, pp 209–210, 234, 351–354, 384

Colorado, cement manufacture in .....MR 1882, pp 462–463; MR 1883–84, p 674; MR 1885, p 409; MR 1886, p 564; MR 1889–90, p 462; MR 1891, p 536

Colorado, clay, brick, and pottery industry of.................MR 1882, pp 473–474; MR 1883–84, p 701; MR 1885, p 423; MR 1886, p 571; MR 1887, pp 535, 537, 541; MR 1888, pp 558, 566; MR 1891, p 524

Colorado, coal area and statistics of....Ann 2, p xxviii; MR 1882, pp 38–48; MR 1883–84, pp 12, 24–38; MR 1885, pp 11, 18–26; MR 1886, pp 225, 230, 243–250; MR 1887, pp 169, 171, 212–221; MR 1888, pp 169, 171, 226–239; MR 1889–90, pp 147, 179–194; MR 1891, pp 180, 215–218

Colorado, coals from, analyses of.............................Bull 64, pp 55–57; MR 1889–90, pp 181, 182, 186, 187, 188

Colorado, coke in, the manufacture of.....MR 1883–84, pp 157–160; MR 1885, pp 80, 87–88; MR 1886, pp 378, 384, 392–393; MR 1887, pp 383, 389, 395–397; MR 1888, 395, 400, 407; MR 1891, pp 360,377

Colorado, constitution of, extracts from the, relating to irrigation........Ann 11, II pp 240–241

Colorado, copper from, statistics of........Ann 2, p xxix; MR 1882, pp 216, 227–228; MR 1883–84, pp 329, 341; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84

Colorado, Cretaceous rocks of......................Bull 82, pp 145, 146, 149, 150, 154, 156, 157, 159, 160, 161, 164, 166–179, 230–231, 236–237

Colorado; efflorescence on sandstone from Cliff creek, Gunnison county, analysis of..Bull 60, p 170

Colorado; fossil butterflies of Florissant..........................Ann 8, I, pp 433–474

Colorado, fossils from........Ann 3, pp 420–470; Ann 4, pp 290, 297, 300; Ann 6, pp 552, 553; Ann 8, II, pp 911–913; Bull 29, pp 16–22; Bull 37, pp 38, 39, 55

Colorado, geologic and paleontologic work in .....Ann 2, pp 19–20; Ann 3, pp 22, 26–27; Ann 4, pp 36–38, 41; Ann 5, pp 44–46, 49, 57; Ann 6, pp 63–66, 72; Ann 7, pp 91–92, 112, 119; Ann 8, I, pp 144–145, 173; Ann 9, pp 78, 88–90, 114, 131; Ann 10, I, pp 25–26, 137–139, 159, 176; Ann 11, I, pp 78, 87–88, 101, 107, 108, 123–124; Ann 12, I, pp 56, 96–98, 107, 114

Colorado, geologic maps of, listed..............Bull 7, pp 131–133, 135, 136, 138, 171

Colorado; geology and mining industry of Leadville...............Ann 1, pp 20–21; Ann 2, pp 201–290; Mon XII

Colorado; geology and physiography of a portion of northwestern Colorado and adjacent parts of Utah and Wyoming...................Ann 9, pp 677–712

Colorado, gold and silver of, statistics of....Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 77, 80

Colorado, gypsum deposits, industry, and statistics of....MR 1882, p 528; MR 1883–84, p 812; MR 1885, p 463; MR 1886, p 622; MR 1887, p 601; MR 1889–90, pp 465, 466; MR 1891, pp 580, 581

Colorado; hypersthene-andesite and triclinic pyroxene in augitic rocks, with a geological sketch of Buffalo peaks..Bull 1

Colorado; insects of special interest from Florissant and other points in the Tertiaries of Colorado and Utah..Bull 93

Colorado, iron and steel from, statistics of........MR 1882, pp 120, 125, 129, 130, 133, 134, 135, 136, 137, 144–147; MR 1883–84, pp 252, 281–285; MR 1885, pp 182, 184, 186, 196; MR 1886, p 18; MR 1887, pp 11, 28–29, 52–54; MR 1888, pp 15, 33; MR 1889–90, pp 10, 17, 24, 35; MR 1891, pp 12, 26

Colorado, irrigation, provisions relating to, in the constitution of................Ann 11, II, pp 240–241

Colorado, irrigation surveys, engineering, hydrography, segregations, etc., in..Ann 10, II, pp viii, 18, 58, 62–63, 68–71, 86, 93–98; Ann 11, II, pp 133–144; Ann 12, II, pp 55–127, 247–251

Colorado; kaolin from the Waterfall mine, Gunnison county, description and analysis of...Bull 60, p 136

Colorado, lead from, statistics of......MR 1882, pp 310–311; MR 1883–84, pp 412, 416, 419–422; MR 1885, pp 248, 250–257; MR 1886, pp 144–146; MR 1887, pp 105–107; MR 1888, p 87; MR 1889–90, p 80; MR 1891, p 105

Colorado, manganese ore from..MR 1885, p 348; MR 1889–90, pp 127, 131; MR 1891, pp 127, 132–133

Colorado, mineral species from, new..............................Bull 20, pp 100–109

Colorado, mineral springs of.............Bull 32, pp 188–193; MR 1883–84, p 980; MR 1885, p 537; MR 1886, p 715; MR 1887, p 683; MR 1888, p 626; MR 1889–90, pp 522, 525; MR 1891, pp 603, 604

Colorado; minerals from Gunnison and Custer counties, analyses of....Bull 90, p 62

Colorado; minerals from the basalt of Table mountain, Golden....Bull 20, pp 13–39

Colorado; minerals from the neighborhood of Pike's peak..........Bull 20, pp 40–74

Colorado, minerals of, the useful..........MR 1882, pp 748–753; MR 1887, pp 707–714

Colorado, natural gas in..........MR 1887, pp 498–499

Colorado, Neocene beds of..........Bull 84, pp 304–309

Colorado, nickel ore in..........MR 1882, p 404; MR 1883–84, p 539

Colorado, petroleum in, localities and statistics of..........MR 1882, p 211; MR 1883–84, pp 216–217; MR 1887, pp 438, 455–456; MR 1888, pp 464–466; MR 1889–90, pp 292, 332–340; MR 1891, pp 405, 407, 432

Colorado, reservoir sites and irrigable lands in, reported by topographers..Ann 11, II, pp 301–302, 310

Colorado; sandstone from Boulder county, analysis of..........MR 1889–90, p 384

Colorado; sandstone from the Armejo quarry, analysis of..........Bull 42, p 141

Colorado, sanidine in certain rhyolites from, the lustre exhibited by..Bull 20, pp 75–80

Colorado, silver and gold in, comparative production of..........Ann 2, p xxxvi

Colorado, topaz from, an unusual occurrence of..........Bull 20, pp 81–82

Colorado, topographic work in..Ann 3, p 22; Ann 4, pp 6–7, 35–36; Ann 5, pp 9, 44–46; Ann 7, p 57; Ann 10, II, pp 18, 68–71; Ann 11, II, pp 299–301; Ann 12, I, p 45

Colorado; water from a spring near Denver, analysis of..........Bull 60, p 174

Colorado and Kansas, Arkansas river basin in, irrigation problems relating to the..........Ann 11, II, pp 210–214

Colorado and New Mexico, Rio Grande basin in, hydrography of the.....Ann 12, II, pp 240–290

Colorado and New Mexico, Rio Grande basin in, irrigation problems relating to the..........Ann 11, II, pp 215–227

Colorado, Utah, and Wyoming, geology and physiography of portions of....Ann 9, pp 677–712

Colorado river. See Grand canyon.

Colorado river basin, hydrography of the..........Ann 12, II, pp 290–316

Colorado river basin, irrigation problems relating to the.......Ann 11, II, pp 229–231

Colors and conventional symbols adopted for geologic maps and sections..Ann 10, I, pp 67–79

Columbia formation, description of the...Ann 7, pp 594–612, 635; Ann 12, I, pp 384–407

Columbite from the Etta tin mine, Dakota, analysis of..........MR 1888, p 151

Columnar structure in obsidian..........Ann 7, p 257

Columnar structure of basalt in volcanic necks..........Ann 6, pp 172–174

Compressibility of liquids..........Bull 92

Comstock lode, alteration of minerals in the..........Mon III, p 20

Comstock lode, brief description of the..........Ann 1, pp 39–46

Comstock lode, decomposition products from the, chemical analyses of.....Mon III, pp 217–218

Comstock lode, history of the..........Ann 1, p 71; Ann 2, pp xxxvii–xxxviii

Comstock lode, mechanical appliances used on the..........Ann 1, pp 50–52, 72

Comstock lode and Washoe district, geology of the..........Ann 2, pp xxiv–xxvi, 291–330; Mon III

Comstock mine waters, analyses of..........Mon III, p 152

Comstock mining and miners..........Mon IV

Concentration, natural, of iron ores in the Penokee district....Mon XIX, pp 285–290

Conchifera, nonmarine fossil, of North America..........Ann 3, pp 420–443

Concretions, analysis of..........Mon XIII, p 65

Concretions in sandstone, origin of..........Mon XIII, pp 64–68

Conditions, requisite and qualifying, of artesian wells..........Ann 5, pp 125–173

Conference of geologists and lithologists on geologic nomenclature and map notation in January, 1889..........Ann 10, I, pp 56–67

Conglomerates of the Keweenaw series described..........Mon V, pp 127–133

Conichalcite from Tintic mining district, Utah .... Bull 20, pp 84–85
Coniferæ of the Dakota group .... Mon xvii, pp 32–36
Coniferæ of the Laramie flora .... Bull 37, pp 14–16
Coniferæ of the older Mesozoic of Virginia .... Mon vi, pp 85–89
Coniferæ of the Potomac or younger Mesozoic .... Mon xv, pp 193–262
Connecticut, altitudes in .... Bull 5, pp 71–72; Bull 76
Connecticut, boundary lines of .... Bull 13, p 68
Connecticut, brick industry of .... MR 1887, pp 535, 537; MR 1888, pp 558, 566
Connecticut, building stone from, statistics of ...... MR 1882, p 451; MR 1887, pp 513, 521; MR 1888, p 536; MR 1889–90, pp 374, 385; MR 1891, pp 457, 458, 464
Connecticut cedes territory to general government .... Bull 13, pp 26, 66–70
Connecticut, cobalt deposit in .... MR 1883–84, p 544
Connecticut, fossils from .... Ann 8, ii, p 854
Connecticut, geologic and paleontologic investigations in .... Ann 6, p 36; Ann 7, p 61; Ann 9, p 76; Ann 11, i, p 59; Ann 12, i, pp 62, 66, 121, 125
Connecticut, geological maps of, listed .... Bull 7, pp 52, 53, 54
Connecticut, glacial investigations in .... Ann 3, pp 379, 380; Ann 7, p 157
Connecticut, iron and steel from, statistics of .... Ann 2, xxviii; MR 1882, pp 120, 125, 129, 131, 133, 135; MR 1883–84, p 252; MR 1883–84, pp 270–271; MR 1885, pp 182, 188; MR 1886, pp 14, 17, 42; MR 1887, pp 11, 16; MR 1888, pp 14, 17; MR 1889–90, pp 10, 17, 24, 35; MR 1891, pp 12, 27
Connecticut, lime production of .... MR 1887, p 532; MR 1888, p 555
Connecticut; limestone from Fairfield county, analysis of .... MR 1889–90, p 386
Connecticut, mineral springs of .... Bull 32, pp 25–26; MR 1883–84, p 980; MR 1885, p 537; MR 1886, p 716; MR 1887, p 683; MR 1888, p 626; MR 1889–90, pp 522, 526; MR 1891, p 604
Connecticut, minerals of, the useful .... MR 1882, pp 672–674; MR 1887, pp 714–716
Connecticut, nickel production of .... MR 1882, pp 401–402; MR 1883–84, p 539
Connecticut surveyed by coöperation of the state .... Ann 10, i, pp 7, 88
Connecticut, topographic work in .... Ann 10, i, pp 86, 88, 89; Ann 11, i, p 35; Ann 12, i, p 25
Connecticut river, rock formations of .... Bull 80, pp 26–27
Connecticut valley area of the Newark system .... Bull 85, pp 20, 80–81
Connecticut valley, structure of the Triassic formation of the ...... Ann 7, pp 455–490
Connecticut valley and New Jersey, fossil fishes and plants of the Triassic rocks of .... Mon xiv
Connecticut valley. See, also, Massachusetts.
Contact metamorphism not marked about intrusive rocks of Mosquito range, Colorado .... Mon xii, p 307
Contact phenomena in the Penokee district .... Mon xix, pp 171–174, 184–185, 297–298
Contractions of substances due to cooling under pressure .... Bull 92, pp 56–61
Cook (G. H.), sketch of the geology of the Cretaceous and Tertiary formations of New Jersey .... Mon ix, pp ix–xiii
Cooling, sudden, the effect of, exhibited by glass and steel .... Bull 42, pp 98–131
Cooling under pressure, contractions due to .... Bull 92, pp 56–61
Copiapite from California .... Bull 61, pp 25–26
Copper-bearing rocks of lake Superior .... Ann 1, pp 70–71; Ann 2, pp xxxi–xxxiv; Ann 3, pp 89–188; Mon v
Copper, cupola smelting of, in Arizona .... MR 1883–84, pp 397–410
Copper industry of the United States .... MR 1882, pp 213–231; MR 1883–84, pp 322–343; MR 1885, pp 208–243
Copper, metallurgy of .... MR 1882, pp 257–280
Copper minerals from Utah, notes on certain rare .... Bull 55, pp 38–47
Copper ore, analysis of .... MR 1882, pp 258, 286
Copper ores and furnace products, the roasting of .... MR 1882, pp 280–297

Copper production of the world ......MR 1883-84, pp 355-374; MR 1885, pp 228, 243; MR 1886, pp 128-139; MR 1887, pp 87-97; MR 1888, pp 73-77; MR 1891, pp 100-101

Copper slags, analyses of..........................MR 1883-84, pp 388, 405, 408

Copper smelting ....Bull 26

Copper, statistics of........ MR 1882, pp 213-305; MR 1883-84, pp 322-410; MR 1885, pp 208-243; MR 1886, pp 109-139; MR 1887, pp 66-97; MR 1888, pp 43-77; MR 1889-90, pp 56-77; MR 1891, pp 81-102

Copper sulphide, solubility of..........................Mon XIII, pp 433-434, 474

Copperas, statistics of ....MR 1882, p 607; MR 1883-84, pp 952-953; MR 1886, pp 684-685

Coral, analyses of ....Bull 52, p 29; Bull 60, pp 162-164

Coral, coral rocks, coquina, etc., from Florida and other localities..Bull 60, pp 162-164

Coral reef soils...Ann 12, I, pp 247-250

Corda (August Joseph), biographical sketch of.........................Ann 5, p 374

Corea, fossil plants of, literature of the ....Ann 8, II, p 790

Corrasion, analysis and laws of...............Ann 2, pp 157-158; Mon II, pp 231-233

Corrasion in the Grand canyon chasm ....Ann 2, pp 156-161; Mon II, pp 230-244

Corrasion. See, also, Degradation.

Correlation and comparison of lower Cambrian................Ann 10, I, pp 595-597

Correlation essays published by the Geological Survey:

  Archean and Algonkian, by C. R. Van Hise..................................Bull 86

  Cambrian, by C. D. Walcott ....Bull 81

  Cretaceous, by C. A. White ....Bull 82

  Devonian and Carboniferous, by H. S. Williams.............................Bull 80

  Eocene, by W. B. Clark..Bull 83

  Neocene, by W. H. Dall and G. D. Harris ....Bull 84

  Newark system, by I. C. Russell ....Bull 85

Correlation, geologic, plan for discussion of, and work in......Ann 10, I, pp 10-12, 108-113; Bull 80, pp 7-9

Correlation of American strata with one another and with European systems ....Ann 9, pp 16-17

Correlation of eruptive with intrusive rocks....................Ann 12, I, pp 650-658

Correlation of formations of the Penokee district................Mon XIX, pp 468-474

Correlation of metamorphic rocks of the Coast ranges of California.......Mon XIII, pp 182-188

Correlation of the rock groups and unconformities of the lake Superior region.............................Ann 7, pp 440-441; Ann 10, I, pp 458-464

Correlation of transition beds....................................Bull 15, pp 13-17

Correlation of western terranes with eastern series by means of fossil plants, difficulties in..Bull 98, pp 109-110

Correlation; Paleozoic and Mesozoic types in Texas, mingling of............Bull 77

Correlation, principles of, general..............................Bull 85, pp 108-116

Correlation, principles of, illustrated by phenomena of the lake Superior region...Ann 7, pp 371-448

Correlation, value of lithological and physical characters for purposes of.....................................Ann 7, pp 378-390; Bull 19, pp 11-12

Correlations, use of fossils in establishing.......................Ann 7, pp 374-377

Correlations, use of unconformities in establishing................Ann 7, pp 439-446

Correlations and classifications of Paleozoic formations in the Acadian province...Bull 80, pp 226-257

Corundum, origin of, the gneiss dunyte contacts of Corundum hill, North Carolina, in relation to the ....Bull 42, pp 45-63

Corundum, statistics of......MR 1882, pp 476-477; MR 1883-84, pp 714-719, 733-736; MR 1885, pp 429-432; MR 1886, pp 585-586; MR 1887, p 553; MR 1888, p 577; MR 1889-90, p 457; MR 1891, p 555

Cosalite from La Plata county, Colorado........Bull 20, pp 95–96
Costa Rica, sketch of the geology of........Bull 84, p 188
Coutchiching series of rocks of the Rainy lake region......Bull 86, pp 65–67, 162–167
Crater lake, Oregon, special examination of........Ann 8, I, pp 156–158
Craters, basaltic, of the Bonneville basin........Mon I, pp 319–330
Craters, basaltic, of the Uinkaret plateau........Ann 2, pp 118, 121
Craters of Mono valley, California........Ann 8, I, pp 372–389
Crawfish as soil-makers........Ann 12, I, pp 278–279
Cretaceous; a correlation essay, by C. A. White........Bull 82
Cretaceous; Aucella in California........Mon XIII, pp 226–232
Cretaceous; Cephalopoda from the Cretaceous marls of New Jersey......Mon XVIII, pp 243–283
Cretaceous; Chico-tejon series........Ann 6, pp 68–70, 73; Bull 15, pp 11–17; Bull 19, pp 14, 17
Cretaceous; Chico-tejon series in Oregon and Washington, equivalents of the........Bull 51, pp 28–32
Cretaceous; Chico-tejon series of California, new fossil Mollusca from the....Bull 51, pp 11–27
Cretaceous; Dakota group, the flora of the........Mon XVII
Cretaceous; Enclimatoceras ulrichi, description of........Bull 4, pp 16–17
Cretaceous formation in California........Mon XIII, pp 178–180, 460–461
Cretaceous formations in southwestern Kansas........Bull 57, pp 27–31
Cretaceous formations in Texas........Ann 8, I, pp 180–181
Cretaceous formations in the great Sioux reservation, Dakota.....Bull 21, pp 11–12
Cretaceous, fossil birds from the........Ann 3, pp 49–88
Cretaceous fossils from Alaska........Bull 4, pp 10–15
Cretaceous fossils from Arctic America........Bull 82, p 203
Cretaceous fossils from California........Bull 22
Cretaceous; fossils from Shasta and Chico-tejon groups in California......Bull 15; Bull 19; Bull 51, pp 11–27
Cretaceous fossils from Vancouver island region........Bull 51, pp 33–48
Cretaceous; Gasteropoda from the marl beds of New Jersey....Mon XVIII, pp 19–189
Cretaceous; Laramie flora, types of the........Bull 37
Cretaceous; Laramie formation, discussion of the........Bull 82, pp 145–153
Cretaceous; Laramie group, historical review of opinion concerning the....Ann 6, pp 406–433
Cretaceous; Laramie group, nature and extent of the........Ann 6, pp 433–436
Cretaceous; Laramie group, recent collections of fossil plants from the........Ann 6, pp 536–557
Cretaceous; Laramie group, stratigraphy and correlation of the....Bull 82, pp 127, 148; Bull 83, pp 111–134, 145–146
Cretaceous; Laramie group, synopsis of the flora of the........Ann 6, pp 399–557
Cretaceous; Laramie Molluscan fauna, the relation of the, to that of the succeeding fresh-water Eocene and other groups........Bull 34
Cretaceous; Laramie Ostreidæ........Ann 4, pp 307–308
Cretaceous; Laramie, Senonian, and Eocene plants, table of distribution of, and discussion thereof........Ann 6, pp 443–536
Cretaceous Molluscan fauna of the Puget group........Bull 51, pp 49–63
Cretaceous; nonmarine fossil Mollusca of North America........Ann 3, pp 411–486
Cretaceous Ostreidæ of North America........Ann 4, pp 290–308
Cretaceous; Potomac beds, location and geology of the ....Ann 7, pp 546–547, 613–616, 636; Ann 12, I, pp 421–424; Mon XV, pp 33–62; Bull 56, pp 38–39
Cretaceous; Potomac formation, fossil wood and lignite of the........Bull 56
Cretaceous; Potomac or younger Mesozoic flora........Mon XV
Cretaceous; Potomac plants, geological affinities of the........Mon XV, pp 333–348
Cretaceous rocks containing bitumen deposits........Ann 11, I, p 597

Cretaceous rocks in northeastern Iowa........Ann 11, I, pp 304–308
Cretaceous rocks in the Lassen peak district, California........Ann 8, I, pp 407–411
Cretaceous rocks in the region of the Uinta mountains........Ann 9, pp 689–690
Cretaceous rocks of Alaska........Bull 51, pp 64–70
Cretaceous rocks of Martha's vineyard........Ann 7, pp 325–326
Cretaceous rocks of Texas........Bull 45, pp 71–84
Cretaceous rocks of Texas, description of certain aberrant forms of the Chamidæ from the........Bull 4, pp 5–9
Cretaceous rocks of the Grand canyon district........Ann 2, pp 56–60, 65–66, 76–77; Mon II, pp 16, 31–34, 212–215
Cretaceous rocks, upper, of the Mississippi embayment........Ann 12, I, pp 419–424
Cretaceous strata in California........Ann 8, II, pp 972–982; Bull 51, pp 11–14
Cretaceous system of the Plateau country........Ann 6, pp 138–140, 166–167, 177–178, 185–188
Cretaceous and Tertiary formations of New Jersey, sketch of the geology of the........Mon IX, pp ix–xiii
Cretaceous and Tertiary strata of the Tuscaloosa, Tombigbee, and Alabama rivers........Bull 43
Cretaceous, volcanic, and metamorphic rocks of northern California, general distribution of the........Bull 33, pp 18–19
Cretaceous. See, also, Mesozoic.
Crinoidea of the United States........Bull 97, pp 21–29
Croffut (W. A.), administrative report for 1888–89........Ann 10, I, p 189
Croffut (W. A.), administrative report for 1889–90........Ann 11, I, pp 131–132
Croffut (W. A.), administrative report for 1890–91........Ann 12, I, pp 141–142
Croffut (W. A.), suggestions for the preparation of manuscript........See p 323 of this bulletin
Cross (W.), an unusual occurrence of topaz........Bull 20, pp 81–82
Cross (W.), lists of ores, minerals, and mineral substances of industrial importance in several of the states........MR 1882, pp 748–759
Cross (W.), lustre exhibited by sanidine in certain rhyolites........Bull 20, pp 75–80
Cross (W.), notes upon the Henry mountain rocks........Mon XII, pp 359–362
Cross (W.), on hypersthene-andesite and on tryclinic pyroxene in augitic rocks........Bull 1, pp 19–38
Cross (W.), petrography of the Leadville region........Mon XII, pp 315–362
Cross (W.) and Hillebrand (W. F.), contributions to the mineralogy of the Rocky mountains........Bull 20
Cross (W.) and Hillebrand (W. F.), minerals from the basalt of Table mountain, Golden, Colorado........Bull 20, pp 13–39
Cross (W.) and Hillebrand (W. F.), minerals from the neighborhood of Pike's peak........Bull 20, pp 40–73
Crust of the earth, elementary composition of the........Bull 78, pp 35–42
Crustacea; catalogue of American Paleozoic non-trilobites........Bull 56, pp 149–177
Crustacea; catalogue of American Paleozoic Trilobita........Bull 63, pp 79–148
Crustacea; description of species of the middle Cambrian of North America........Bull 30, pp 146–148
Crustacea, Devonian, of the Eureka district........Mon VIII, pp 204–206
Crustacea of the fresh-water North American Jurassic........Bull 29, pp 23–24
Crustacea of the Great basin........Bull 11, p 23
Crustacea of the higher Devonian of Ontario county, New York........Bull 16, pp 20, 43–47
Crustacea of the Olenellus zone........Ann 10, I, pp 625–629
Crustacea of the Wasatch group, description of species of the........Bull 34, p 32
Crustacea, Paleozoic, bibliography of, from 1698 to 1889, including a list of North American species and a systematic arrangement of genera........Bull 63
Crustacea; Protocaris, a new genus from the middle Cambrian........Bull 10, pp 50–51
Crustacea. See, also, Trilobita.

Cryolite from near Pike's peak, Colorado, occurrence, chemical composition, etc., of .... Bull 20, pp 41–49

Cryolite, statistics of .... MR 1882, p 608; MR 1883–84, p 954; MR 1886, pp 692–693; MR 1887, 659; MR 1889–90, p 473; MR 1891, p 147

Cryptogams, classification of .... Ann 5, pp 437–439

Cryptogams of the Dakota group .... Mon xvii, p 23

Cryptogams of the Laramie flora .... Bull 37, pp 13–14

Cryptogams, vascular, from the Carboniferous basins of southwestern Missouri .... Bull 98, pp 17–104

Crystalline rocks, subaërial decay of .... Bull 52, pp 12–15, 18–20

Crystalline schists, metasomatic origin of .... Ann 10, i, p 434

Crystalline schists of the lake Superior region .... Ann 10, i, pp 355–364

Crystallization, development of, in the igneous rocks of Washoe, Nevada, etc .... Bull 17

Crystallization in the granite of the lake Superior district .... Ann 10, i, pp 356–358

Crystallization, influence of pressure on, in igneous magmas .... Bull 66, p 25

Crystallization of granitic magmas, course of .... Mon xix, p 113

Crystallization of igneous magmas, influence of conditions upon .... Ann 12, i, pp 655–657

Crystallographic determinations of pachnolite from near Pike's peak, Colorado .... Bull 20, pp 50–52

Crystallographic study of the thinolite of lake Lahontan .... Bull 12

Crystals, cinnabar, from California .... Bull 61, pp 11–22

Crystals of thinolite, sections of .... Bull 12, pp 17–19

Cuba, manganese production of .... MR 1887, p 154; MR 1888, pp 137–139; MR 1889–90, p 130; MR 1891, pp 142–143

Currents as agents of littoral transportation .... Ann 5, pp 85–86; Mon i, p 37

Curtis (J. S.), administrative report for 1884–85 .... Ann 6, p 71

Curtis (J. S.), mining geology of Eureka district, Nevada .... Ann 4, pp 221–251

Curtis (J. S.), quantitative determination of silver by means of microscope .... Ann 6, pp 323–352

Curtis (J. S.), silver-lead deposits of Eureka, Nevada .... Mon vii

Cycadaceæ of the Dakota group .... Mon xvii, pp 26–31

Cycadeæ of the older Mesozoic of Virginia .... Mon vi, pp 84–85

Cyclic twisting .... Bull 94, pp 33–39

Dacite from Washoe, Nevada, analysis of .... Bull 27, p 65

Dacite of the Eureka district, Nevada .... Mon xx, pp 236, 368–373

Dacites from Lassen's peak, California, analyses of .... Bull 9, p 16

Daggett (E.), analyses and calorific values of some Utah coals .... MR 1882, pp 76–81

Dakota group, the flora of the .... Mon xvii

Dakota, South, liebenerite from Rapid city, analysis of .... Bull 78, p 120

Dakota, South, sandstone from, tests of .... MR 1889–90, p 429

Dakotas, altitudes in the ... Bull 5, pp 73–75; Bull 72, pp 195, 196, 201, 217–223; Bull 76

Dakotas; Archean formations of the northwestern states .... Ann 5, pp 175–242

Dakotas, artesian waters in the .... Ann 11, ii, pp 257–260, 274

Dakotas, artesian wells in the, list of .... Ann 11, ii, pp 268–270

Dakotas, boundary lines of, and formation of territory .... Bull 13, pp 31, 121

Dakotas, building stone from the, statistics of .... MR 1882, p 451; MR 1889–90, pp 374, 429

Dakotas, Cambrian rocks of the .... Bull 81, pp 214–216, 347–349

Dakotas; cassiterite from veins in the Black hills, analysis of .... MR 1888, p 153

Dakotas, cement production of .... MR 1891, p 536

Dakotas, coal area and statistics of the .... MR 1882, p 49; MR 1883–84, pp 12, 38–39; MR 1885, pp 11, 26; MR 1886, pp 225, 230, 250–251; MR 1887, pp 169, 222; MR 1888, pp 169, 171, 240; MR 1889–90, pp 147, 234; MR 1891, 180, 275

Dakotas; columbite from the Etta tin mine, analysis of .... MR 1888, p 151

Dakotas, Cretaceous rocks of the .... Bull 82, pp 145, 149, 158, 160, 166–179

Dakotas, fossils from the .... Ann 3, pp 427, 436, 448; Ann 6, pp 554, 555; Ann 8, II, pp 902–904; Bull 37, pp 67, 76

Dakotas, geologic and paleontologic investigations in the .... Ann 3, pp 19, 21; Ann 4, p 24; Ann 5, pp 21–22, 27, 28–29, 50, 56; Ann 6, pp 33–34; Ann 7, pp 76–77, 79, 81, 112; Ann 8, I, pp 143, 174; Ann 9, pp 72, 85, 86, 114; Ann 10, I, p 159; Ann 11, I, pp 75, 101, 102; Ann 12, I, p 119

Dakotas, geologic maps of the, listed .... Bull 7, pp 114, 115, 116

Dakotas, glacial investigations in the .... Ann 3, pp 393–400; Ann 7, p 157

Dakotas; glacial lake Agassiz, the upper beaches and deltas of the .... Bull 39

Dakotas, gold and silver from the, statistics of .... Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 78, 79

Dakotas; gypsum deposits in the Black hills .... MR 1886, p 622; MR 1889–90, pp 465, 466; MR 1891, pp 580, 582

Dakotas, lead from the, statistics of .... MR 1887, p 110; MR 1889–90, p 80

Dakotas; lignite from the Turtle mountains, analysis of .... Bull 27, p 74

Dakotas; lignites of the great Sioux reservation, a report on the region between the Grand and Moreau rivers .... Bull 21

Dakotas, manganese ore from, analysis of .... MR 1891, p 137

Dakotas, mica production of the .... MR 1882, p 583; MR 1883–84, pp 909–910; MR 1888, p 614

Dakotas, mineral springs of the .... Bull 32, pp 159–161

Dakotas, minerals of the, the useful .... MR 1882, p 754; MR 1887, pp 716–718

Dakotas, Neocene beds of the .... Bull 84, pp 288–293

Dakotas; nickel industry in South Dakota .... MR 1891, p 168

Dakotas; sandstone production of South Dakota .... MR 1891, pp 461, 463

Dakotas; tantalite from the Etta tin mine, analysis of .... MR 1888, p 151

Dakotas; tin ore in the Black hills .... MR 1883–84, pp 602–613; MR 1885, p 370; MR 1886, p 214; MR 1887, pp 134–136; MR 1888, pp 144–156; MR 1889–90, p 120; MR 1891, p 164

Dakotas, topographic work in the .... Ann 12, I, p 49

Dakotas; triplite from the Black hills .... Bull 60, pp 135–136

Dall (W. H.), administrative report for 1884–85 .... Ann 6, pp 78–80

Dall (W. H.), administrative report for 1885–86 .... Ann 7, pp 120–122

Dall (W. H.), administrative report for 1886–87 .... Ann 8, I, pp 181–184

Dall (W. H.), administrative report for 1887–88 .... Ann 9, pp 123–127

Dall (W. H.), administrative report for 1888–89 .... Ann 10, I, pp 166–169

Dall (W. H.), administrative report for 1889–90 .... Ann 11, I, pp 109–113

Dall (W. H.), administrative report for 1890–91 .... Ann 12, I, pp 115–118

Dall (W. H.), list of marine Mollusca .... Bull 24

Dall (W. H.), quoted on glaciation in Alaska .... Ann 5, p 354

Dall (W. H.) and **Harris** (G. D.), Neocene of North America, a correlation essay .... Bull 84

Dalles group of rocks of Oregon .... Bull 84, p 285

Damourite from Stoneham, Maine, description and analysis of .... Bull 9, p 11

Dana (E. S.), crystallographic study of the thinolite of lake Lahontan ...... Bull 12

Darton (N. H.), bibliography of North American geology for 1886 .... Bull 44

Darton (N. H.), record of North American geology for 1887 to 1889 .... Bull 75

Darton (N. H.), record of North American geology for 1890 .... Bull 91

Darton (N. H.), record of North American geology for 1891 .... Bull 99

Darton (N. H), the relations of the traps of the Newark system in the New Jersey region .... Bull 67

Darwin (C. C.), administrative report for 1884–85....................Ann 6, pp 97–101
Darwin (C. C.), administrative report for 1885–86....................Ann 7, pp 138–143
Darwin (C. C.), administrative report for 1886–87 ....Ann 8, I, pp 203–209
Darwin (C. C.), administrative report for 1887–88....................Ann 9, pp 145–151
Darwin (C. C.), administrative report for 1888–89 ....Ann 10, I, pp 190–198
Darwin (C. C.), administrative report for 1889–90 ....Ann 11, I, pp 137–140
Darwin (C. C.), administrative report for 1890–91 ....Ann 12, I, pp 142–144
Davis (H. J.), pyrites, statistics of....................MR 1885, pp 501–517
Davis (W. M.), structure of the Triassic formation of the Connecticut valley ....Ann 7, pp 455–490
Dawson (Sir John William), biographical sketch of....................Ann 5, pp 377–378
Day (D. T), administrative report for 1886–87....................Ann 8, I, pp 195–201
Day (D. T.), administrative report for 1887–88 ....Ann 9, pp 134–140
Day (D. T.), administrative report for 1888–89 ....Ann 10, I, pp 182–188
Day (D. T.), administrative report for 1889–90 ....Ann 11, I, pp 130–131
Day (D. T.), administrative report for 1890–91 ....Ann 12, I, pp 129–134
Day (D. T.), bromine, statistics of.....MR 1883–84, pp 851–853; MR 1885, pp 486–487
Day (D. T.), chromium, statistics of ....MR 1882, pp 428–430; MR 1883–84, pp 567–573; MR 1885, pp 357–360
Day (D. T.), cobalt, statistics of.......MR 1883–84, pp 544–549; MR 1885, pp 361–365
Day (D. T.), feldspar, statistics of ....MR 1883–84, pp 933–934
Day (D. T.), iodine, statistics of.......MR 1883–84, pp 854–858; MR 1885, pp 488–490
Day (D. T.), manganese, statistics of...MR 1882, pp 424–427; MR 1883–84, pp 550–566
Day (D. T.), manufactured fertilizers ....MR 1883–84, pp 815–826
Day (D. T.), mineral resources of the United States in 1886 ....MR 1886
Day (D. T.), mineral resources of the United States in 1887 ....MR 1887
Day (D. T.), mineral resources of the United States in 1888 ....MR 1888
Day (D. T.), mineral resources of the United States in 1889 and 1890 ....MR 1889–90
Day (D. T.), mineral resources of the United States in 1891 ....MR 1891
Day (D. T.), phosphate rock, statistics of....................MR 1883–84, pp 783–805; MR 1885, pp 445–455
Day (D. T.), sulphur, statistics of....................MR 1883–84, pp 864–876
Day (D. T.), tungsten, statistics of ....MR 1882, pp 431–433; MR 1883–84, pp 574–575; MR 1885, p 366
Day (D. T.), zirconium, statistics of.........MR 1883–84, p 661; MR 1885, pp 393–394
Day (W. C.), feldspar, statistics of....................MR 1885, p 523; MR 1886, p 701
Day (W. C.), potassium salts, statistics of....................MR 1887, pp 628–650
Day (W. C.), sodium salts, statistics of ....MR 1887, pp 651–658
Day (W. C.), stone in the United States, statistics of....................MR 1889–90, pp 373–440; MR 1891, pp 456–471
Day (W. C.), structural materials, statistics of ....MR 1886, pp 517–580; MR 1887, pp 503–551; MR 1888, pp 516–575
Day (W. C.), sulphur, statistics of ....MR 1885, pp 494–500; MR 1886, pp 644–647; MR 1887, pp 604–610
Decay and débris of rocks ....Ann 11, I, pp 275–280
Decay, subaërial, of rocks and origin of the red color of certain formations...Bull 52
Decomposition area, effects, products, etc., in the Washoe district..........Mon III, pp 72–80, 209–227, 238–240, 369–372, 383–385
Decomposition of bisilicate minerals in rocks, course of....................Mon III, p 214
Decomposition of ferro-magnesian silicates in rocks....................Mon III, p 384
Decomposition of rock constituents ....Mon III, pp 214–215, 369–372
Decomposition of rocks ....Bull 52
Decomposition of rocks near Comstock lode, Nevada..........Ann 2, pp 295, 307–310
Decomposition of rocks of the Washoe district, Nevada ....Ann 2, pp 295–297; Mon III, pp 72–80, 209–218, 369–372

nposition products from Comstock lode, Nevada, chemical analyses of .... Mon III, pp 217–218

nposition. See, also, Metamorphism.

creek beds of Montana .... Bull 84, pp 287, 288

nation of Newark strata .... Bull 85, pp 78–100

nation of the geoid by loading and unloading .... Mon I, pp 376–377, 379–383; Bull 48

nation of the geoid by the removal, through evaporation, of the water of lake Bonneville .... Mon I, pp 379–383, 421–424

nation. See, also, Diastrophism.

nations in the Mississippi valley .... Ann 11, I, pp 336–347

lation, cliffs due to .... Ann 5, pp 83–84, 112–115; Mon I, pp 34–35, 75–76

lation; corrasion of the Grand canyon of the Colorado .... Ann 2, pp 156–166

lation; drainage system of the Grand canyon district in relation to uplift .... Mon II, pp 72–74, 187–188, 192–196, 218–220

lation; erosion of the Grand canyon of the Colorado .... Mon II, pp 230–260

lation; erosion of the Grand canyon of the Colorado in relation to climate .... Mon II, pp 99–100, 189–191, 196, 222–229

lation; erosion of the Grand canyon of the Colorado in relation to volcanism .... Mon II, pp 96–98, 107–108

lation, glacial and post-glacial, on cape Ann, Massachusetts .... Ann 9, pp 556–567

lation, glacial, of Mono basin, California .... Ann 8, I, pp 347–358

ation; glacial sculpture of mount Desert island, Me .... Ann 8, II, pp 1005–1009

ation of the piedmont region of California in relation to uplift .... Ann 8, I, pp 425–426

ation of the basin of the Colorado river .... Ann 2, pp 57–68, 95–102; Mon II, pp 61–77, 220–229

ation of the island of Oahu, Hawaiian islands .... Ann 4, pp 212–216

ation; post-glacial erosion on Martha's vineyard .... Ann 7, pp 347–351

ation, pre-glacial, in the driftless area of the upper Mississippi .... Ann 6, pp 221–239

ation; rock scorings of the great ice invasions .... Ann 7, pp 155–248

ation; sculpture of the Zuñi plateau .... Ann 6, pp 154–159, 189–190

ation; shore terraces, origin of .... Ann 3, pp 206–211; Ann 5, pp 75–89, 112–116; Mon I, pp 29–37; Mon XI, pp 88–89

ation; subaërial and littoral sculpture contrasted .... Ann 2, pp 183–186

ation; subaërial decay of rocks and origin of the red color of certain formations .... Bull 52

ation, terraces due to .... Ann 5, pp 84–85, 115–120; Mon I, pp 35–37, 78–81, 129

ation. See, also, Drainage systems.

re, altitudes in .... Bull 5, p 76; Bull 76

re, boundary lines of .... Bull 13, pp 80–82

re, brick industry of .... MR 1887, pp 535, 537

re, building stone from, statistics of .... MR 1882, p 451

re, clay materials of .... MR 1891, pp 503–504

re, Cretaceous deposits of .... Bull 82, pp 87–88

re, Eocene deposits in .... Bull 83, pp 43, 86

re, feldspars from, analyses of .... Bull 55, pp 79–80

e, gabbros and associated rocks in .... Bull 59

e, geologic and paleontologic investigations in .... Ann 9, p 122

e, granite production of .... MR 1891, pp 457, 458

e; iron and steel, statistics of .... Ann 2, p xxviii; MR 1882, pp 120, 125, 133, 134, 135; MR 1886, p 18; MR 1887, p 11; MR 1888, p 14; MR 1889–90, p 12; MR 1891, p 61

e, metallic paint production of .... MR 1891, p 597

Delaware, mineral springs of .... Bull 32, p 51
Delaware, minerals of, the useful .... MR 1882, pp 674–675; MR 1887, pp 718–719
Delaware, Neocene beds of .... Bull 84, pp 45–49
Delaware, Potsdam rocks of .... Bull 81, pp 123, 288
Delta swamps .... Ann 10, I, pp 271–282
Deltas and beaches of the glacial lake Agassiz .... Bull 39
Deltas, formation of .... Ann 5, pp 104–108; Mon I, pp 65–70; Mon XI, 96–99
Dendritic tufa of Mono valley, California .... Ann 8, I, pp 311–315
Denmark, fossil plants of, the literature of the .... Ann 8, II, p 778
Density and electrical resistance, relation between, when varying with the temper of steel .... Bull 27, pp 30–50
Denudation, elevation and, of the entire mountain and plateau region of the West in Tertiary times .... Ann 6, pp 189–191
Denudation, the great, in the Grand canyon district .... Ann 2, pp 95–103; Mon II, pp 61–77, 220–222, 250–260
Denudation. See, also, Degradation.
Denver beds, correlation of the .... Bull 83, pp 136–137, 145–146
Deposition and erosion, glacial .... Ann 8, I, pp 355–369
Deposition, conditions of, in the Newark area .... Bull 85, pp 45–53
Deposition; conditions of sedimentation in Bonneville basin .... Ann 2, pp 176–180
Deposition; experiments in the precipitation of fine sediments ... Mon I, pp 205–208; Bull 36; Bull 60, pp 139–145
Deposition; genetic classification of glacial drift and associated deposits ..... Ann 3, pp 296–309
Deposition, glacial, of Mono basin .... Ann 8, I, pp 358–368
Deposition in fresh-water marshes .... Ann 10, I, pp 261–294
Deposition in lakes .... Ann 2, p 174
Deposition in marine marshes .... Ann 6, pp 359–388
Deposition, littoral .... Ann 2, pp 181–182; Ann 3, pp 206–211; Ann 5, pp 90–99; Mon I, pp 46–59, 65–72, 135–166; Mon XI, pp 90–98
Deposition; loess, origin of the .... Ann 6, pp 286–307
Deposition, long era of, from Carboniferous to Tertiary, in the Grand canyon district .... Mon II, pp 208–209
Deposition of perezonal formations .... Bull 84, pp 98–99
Deposition of saline matter by desiccation .... Ann 3, p 199; Mon I, pp 208–209; Mon XI, pp 223–230
Deposition of sand in dunes .... Ann 5, pp 99–100; Ann 9, pp 574–575; Mon I, pp 59–60; Mon XI, pp 153–156
Deposition of travertine and sinter by vegetation of hot springs ... Ann 9, pp 619–676
Deposition of tufa in lake Mono, California .... Ann 8, I, pp 289–290, 297, 311–315
Deposition of tufas in lake Lahontan .... Ann 3, pp 212–221; Mon XI, pp 188–222; Bull 12, pp 10–14
Deposition of tufas in lake Bonneville .... Ann 2, pp 190–191; Mon I, pp 167–169
Deposition; petroleum and natural gas, accumulation of .... Ann 8, II, pp 507–517; Ann 11, I, pp 654–661
Deposition; phosphatic deposits, origin of .. Bull 46, pp 12–15, 40–41, 44, 50–52, 69, 86–90
Deposition; quicksilver ores, origin of ...... Ann 8, II, p 985; Mon XIII, pp 55, 438, 445
Deposition; relation of characters of sediments to characters of marine faunas .... Bull 3
Deposition; spits on shore of Nantucket island, origin of .... Bull 53, pp 12–15, 49–54
Deposition, terraces due to .... Ann 5, pp 90–99, 119–120; Mon I, pp 55–57, 65–71, 81–83, 153–166
Descloizite (?) from Beaverhead county, Montana, description and analysis of .... Bull 60, pp 130–131
Descloizites, three, from new localities, analyses of .. .. Bull 64, pp 24–28

t, mount, Maine, geology of .... Ann 8, II, pp 987-1061
cation, freshening of lakes by .... Ann 2, pp 177-180; Ann 3, pp 224-230; Mon I, pp 208-209, 229, 258; Mon XI, pp 224-230
cation products of Lahontan basin .... Ann 3, pp 224-230; Mon XI, p 223
cation products of Sevier lake, Utah .... Mon I, p 225-227
al rocks of the Keweenaw series .... Mon V, pp 127-133, 151
s head mountain, Colorado, notes upon the occurrence of topaz at.... Bull 20, pp 73-74
ian age, fishes of the .... Mon XVI, pp 23-74
ian fauna of Nevada, New York, falls of Ohio, and Iowa, a summary of the .... Mon VIII, p 6
ian fauna of the Eureka district, Nevada .... Mon XX, pp 70-84, 193, 199
ian faunas, the higher, of Ontario county, New York .... Bull 16
ian; fossil faunas of the upper Devonian in New York and Pennsylvania .... Bull 3
an fossils of the Eureka district, Nevada .... Mon VIII, pp 99-211, 274-278
an fossils of the Eureka district, Nevada, systematic list of the ...... Mon XX, pp 325-330
an; nonmarine fossil Mollusca of North America .... Ann 3, pp 411-486
an rocks containing bitumen deposits .... Ann 11, I, pp 599-600, 634-638
an rocks in northeastern Iowa .... Ann 11, I, pp 314-323
n rocks in the upper Missouri region .... Ann 6, p 51
n rocks of the Eureka district, Nevada .... Ann 3, pp 264-267
n, the upper, Genesee section, New York, fossil faunas of .... Bull 41
n; Uinta sandstone in northwestern Colorado .... Ann 9, pp 687-688
n and Carboniferous—a correlation essay, by H. S. Williams .... Bull 80
n and Carboniferous formations of the Eureka district, Nevada..... Mon XX, pp 63-98
n. See, also, Paleozoic.
agglomerate in relation to greenstone schist, Marquette region, Michigan .... Bull 62, pp 185-191
enstatite-bearing, from Colorado, described .... Bull 1, p 35
from the Keweenaw series described .... Mon V, pp 37-50, 61-68
from the Marquette region, Michigan, described .... Bull 62, pp 138-145, 168-170, 183
from the Washoe district, Nevada, described .... Mon III, pp 48-53, 112-116, 197-199, 381
occurrence of, in the traps of New Jersey .... Bull 67
of the Penokee iron-bearing series, petrographical character of .... Mon XIX, pp 348-359, 410-419
olivine, from the Keweenaw series described .... Mon V, pp 68-77
relations of, to augite-andesite .... Bull 17, pp 12, 16, 20, 40
orphyrite from the Keweenaw series described .... Mon V, pp 77-87
uffs of Michigan, and their metamorphism to greenstones .... Bull 62, pp 133, 158-162
and soapstone from the Penokee district of Michigan and Wisconsin .... Mon XIX, p 357
amygdaloid of the Keweenaw series .... Mon V, pp 87-91
, conventional characters for .... Ann 2, pp liii, liv; Ann 10, I, pp 77-78
peak quartzite at Eureka, Nevada .... Mon XX, p 85
. See Precious stones.
geology, especially in northeastern Iowa .... Ann 11, I, pp 242-244
ism and lake Bonneville .... Ann 2, pp 192-200; Mon I, pp 340-392
ism; character and cause of displacement along fall-line .. Ann 7, pp 616-634
sm; characters of landslips .... Mon I, pp 77, 83-84

Diastrophism; deformation of the geoid by loading and unloading............Mon I, pp 376–377, 379–383; Bull 48

Diastrophism; deformation of the geoid by the removal, through evaporation, of the water of lake Bonneville..........................Mon I, pp 421–424

Diastrophism; dislocation of the Vineyard series, Mass............Ann 7, pp 343–346

Diastrophism; earthquakes in California in 1889..........................Bull 68

Diastrophism; elevation and subsidence inferred from Cenozoic and Mesozoic rocks of Alabama......................................Bull 43, pp 136–138

Diastrophism; fault scarps and fault terraces ....Mon I, pp 76–77, 83

Diastrophism; flow of solids, or the behavior of solids under high pressure..Bull 55, pp 67–75; Bull 64, pp 38–39; Bull 73

Diastrophism in relation to volcanism in the Sierra nevada.....Ann 8, I, pp 428–430

Diastrophism in the eastern portion of the Uinta range...........Ann 9, pp 691–705

Diastrophism in the Newark areas ....Bull 85, pp 78–100

Diastrophism; mechanical origin of the Triassic monocline in Connecticut..Ann 7, pp 481–490

Diastrophism; mountain building, nature of the process of.......Ann 6, pp 195–197

Diastrophism; movements which resulted in the elevation of Mosquito range, Colorado ....Ann 2, pp 211–214, 277

Diastrophism; origin of the Lahontan basin.......................Mon XI, pp 24–28

Diastrophism; orogeny of the Eureka district, Nevada....Mon XX, pp 10–30, 209–217

Diastrophism; post-glacial uplift of Nantucket island ....Bull 53, pp 44–49

Diastrophism; post-Lahontan faults and flexures.... ....Mon XI, pp 274–283

Diastrophism, post-Quaternary, in Mono basin....................Ann 8, I, pp 389–390

Diastrophism; Rocky mountains, origin of the structure of the...Mon XII, pp 24–27

Diastrophism; subsidence of the Grand canyon district..........Mon II, pp 210–214

Diastrophism; subsidence on the coast of Nantucket island, evidence of....Bull 53, pp 28–30, 48

Diastrophism; the Charleston earthquake..........................Ann 9, pp 209–528

Diastrophism; the form and position of the sea level.........................Bull 48

Diastrophism; theory of faults of the Comstock lode ....Ann 2, pp 300–304; Mon III, pp 156–187, 377–378

Diastrophism; uplifts in the Grand canyon district...............Ann 6, pp 158–160, 189–198; Mon II, pp 69–77, 120–121, 191–192, 216–218

Dicotyledons of the Dakota group..............................Mon XVII, pp 42–211

Dicotyledons of the Laramie flora...............................Bull 37, pp 18–104

Differentiation of lavas ....Mon XX, pp 287–289

Dikes associated with iron ore in the Penokee district...................Mon XIX, pp 271–275, 276–279

Dikes in walls of the Grand canyon of the Colorado..............Mon II, pp 95–96

Dikes, intrusive, in the Eureka district, Nevada.................Mon XX, pp 247–249

Dikes of mount Desert island, Maine ....Ann 8, II, pp 1052–1057

Dikes of the cape Ann district, Massachusetts.............Ann 9, pp 579–583, 589–596

Dikes in the lake Superior region....................Mon V, pp 143–144, 370, 379, etc.

Diller (J. S.), a late volcanic eruption in northern California and its peculiar lava...Bull 79

Diller (J. S.), administrative report for 1886–87..................Ann 8, I, pp 193–194

Diller (J. S.), administrative report for 1887–88.....................Ann 9, pp 98–100

Diller (J. S.), administrative report for 1888–89.................Ann 10, I, pp 144–147

Diller (J. S.), administrative report for 1889–90...................Ann 11, I, pp 90–94

Diller (J. S.), administrative report for 1890–91.................Ann 12, I, pp 100–103

Diller (J. S.), geology of Lassen peak district....................Ann 8, I, pp 395–432

Diller (J. S.), notes on the geology of northern California......................Bull 33

Diller (J. S.), peridotite of Elliott county, Kentucky..........................Bull 38

Diller (J. S.) and Clarke (F. W.), turquoise from New Mexico.....Bull 42, pp 39–44

Diller (J. S.) and Whitfield (J. E.), dumortierite from Harlem, New York, and Clip, Arizona........Bull 64, pp 31–33

Dinocerata, an extinct order of gigantic mammals........Ann 5, pp 243–302; Mon x

Dinocerata, bibliography of the........Mon x, pp 225–237

Dinocerata, classification of the........Mon x, pp 190–191

Dinocerata, description of genera of the........Ann 5, pp 255–301; Mon x, pp 11–164

Dinocerata, Eocene, of the Rocky mountain region........Ann 5, pp 249–254

Dinocerata; restoration of Dinoceras and Tinoceras........Ann 5, p 302; Mon x, pp 165–168

Dinocerata, synopsis of genera and species of the suborder........Mon x, pp 193–223

Diorite from Delaware described........Bull 59, pp 29–31

Diorite from the Marquette region, Michigan, described........Bull 62, pp 181–183, 198

Diorite from the Mosquito range, Colorado, described........Mon xii, pp 84, 333–334

Diorite from the Washoe district, Nevada, described........Mon iii, pp 34–45, 93–108, 150, 192–196

Diorite, inclusion in, from near Peekskill, New York; analysis of........Bull 60, p 158

Diorite, relation of, to gabbro near Baltimore, Maryland........Bull 28, pp 34–49

Diphenylamine, compressibility and thermal expansion of........Bull 92, p 34

Disintegration resulting in soils........Ann 12, i, pp 250–268

Dismal swamp, description of (geology, topography, animal life, method of draining, healthfulness, etc.), and fresh-water morasses of United States........Ann 10, i, pp 255–339

Displacements in the Great basin, data concerning........Ann 4, pp 451–453

Displacements in the Plateau country are monoclines........Ann 6, p 118

Displacements in the region of the Uinta mountains........Ann 9, pp 691–706

Displacements of the middle Atlantic coastal plain and piedmont region........Ann 7, pp 616–634

Displacements, recent and more ancient, in the lake Lahontan basin........Mon xi, pp 24–28, 274–283

Displacements. See, also, Diastrophism; Faults.

Distillations, quantitative, an account of a convenient form of apparatus for, with a method for the separation and estimation of boric acid........Bull 42, pp 64–72

Distribution of the Dakota group of fossil plants, table of........Mon xvii, pp 222–225

Distribution, the geographical, of fossil plants........Ann 8, ii, pp 663–960

District of Columbia, altitudes in the........Bull 5, p 77; Bull 76

District of Columbia, boundary lines of the........Bull 13, pp 85–88

District of Columbia, clay and brick industry of the........MR 1883–84, p 696; MR 1887, pp 535, 537; MR 1888, p 558; MR 1891, p 504

District of Columbia, Cretaceous deposits of the........Bull 82, p 89

District of Columbia, geologic investigations in the........Ann 5, p 41; Ann 7, p 109; Ann 8, i, pp 166–167; Ann 9, p 102; Ann 10, pp 150–152; Ann 11, i, pp 65, 68

District of Columbia, iron and steel from the, statistics of........MR 1882, pp 120, 125, 133, 134, 135; MR 1886, p 18

District of Columbia, topographic work in the........Ann 5, pp 8, 41; Ann 6, pp 16, 30; Ann 7, p 109; Ann 8, i, p 100

Divining rod, the........MR 1882, pp 610–626

Dolerite of the Newark system, description and analyses of........Bull 85, pp 66–77

Dolomite, chlorine in, of the Mosquito range, Colorado........Mon xii, p 279

Dolomite from Tuckahoe, New York, analysis of........Bull 60, p 159

Dolomite and residual clay from Morrisville, Alabama, analyses of........Bull 60, p 159

Dolomite marble from Cockeysville, Maryland, analysis of........Bull 60, p 159

Dolomite of the Mosquito range, Colorado........Mon xii, pp 60, 63–66, 278–281

Dolomitic sediments discussed........Mon xii, p 276

Donner lake reservoir sites and canal line........Ann 11, ii, pp 173–174, 182

Douglas (J.), jr., the cupola smelting of copper in Arizona........MR 1883–84, pp 397–410

Douglas (J.), jr., the metallurgy of copper .... MR 1882, pp 257–280
Drainage basins, classification of .... Ann 7, pp 558–562; Ann 12, II, pp 232–234
Drainage districts of the arid region of the United States, map showing the .... Ann 11, II, pp x–xi
Drainage features of the driftless area .... Ann 6, pp 217–218
Drainage in Washington territory, changes in the, due to glaciation .... Bull 40
Drainage of Green river basin in relation to mountain structure ... Ann 9, pp 703–712
Drainage of the Paria plateau .... Mon II, pp 200–203
Drainage, Quaternary, in the Great basin .... Mon XI, pp 28–32, 156–157
Drainage; rivers, origin and persistence of .... Ann 2, pp 60–61; Mon II, pp 72, 219
Drainage system of the district about the head of Chesapeake bay .... Ann 7, pp 550–551, 553–558
Drainage system of the Grand canyon district, origin of the .... Mon II, pp 72–74, 187–188, 192–196, 218–220
Drainage system of the Kaibab plateau .... Ann 2, pp 134–135, 138–140; Mon II, pp 192–198
Drainage. See, also, Degradation; Irrigation; Physiography.
Drift deposits of cape Ann, Massachusetts .... Ann 9, p 546
Drift of northeastern United States, map of the .... Ann 6, pp 204–205
Drift sheets in northeastern Iowa and in Indiana .... Ann 11, I, pp 472–542, 639–641
Drift. See, also, Glacial; Pleistocene.
Driftless area of the upper Mississippi valley .... Ann 6, pp 199–322
Driftless region of the upper Mississippi and environs, geological map of the .... Ann 6, pp 220–221
Dudley (W. L.), iridium, statistics of .... MR 1883–84, pp 581–591
Dumortierite from New York and Arizona ...... Bull 60, pp 133–135; Bull 64, pp 31–33
Dunes and drifting sand .... Mon I, pp 59–60
Dunes, formation of .... Ann 5, pp 99–100
Dunes of gypsum in Bonneville basin .... Mon I, p 223
Dunes, sand, in the Great basin .... Mon XI, pp 153–156
Dunes, sand, of cape Ann district, Massachusetts .... Ann 9, pp 574–575
Dunyte of North Carolina, occurrence, analyses, etc., of the .... Bull 42, pp 45–63
Dutton (C. E.), administrative report for 1879–80 .... Ann 1, pp 28–31
Dutton (C. E.), administrative report for 1880–81 .... Ann 2, pp 5–10
Dutton (C. E.), administrative report for 1882–83 .... Ann 4, pp 22–23
Dutton (C. E.), administrative report for 1883–84 .... Ann 5, pp 42–43
Dutton (C. E.), administrative report for 1884–85 .... Ann 6, pp 59–62
Dutton (C. E.), administrative report for 1885–86 .... Ann 7, pp 97–103
Dutton (C. E.), administrative report for 1886–87 .... Ann 8, I, pp 156–165
Dutton (C. E.), administrative report for 1887–88 .... Ann 9, pp 96–98
Dutton (C. E.), Hawaiian volcanoes .... Ann 4, pp 75–219
Dutton (C. E.), mount Taylor and the Zuñi plateau .... Ann 6, pp 105–198
Dutton (C. E.), physical geology of the Grand canyon district ...... Ann 2, pp 47–166
Dutton (C. E.), report on hydrographic and engineering branches of irrigation survey during 1888–89 .... Ann 10, pp 2, 65–77
Dutton (C. E.), Tertiary history of the Grand canyon district .... Mon II
Dutton (C. E.), the Charleston earthquake .... Ann 9, pp 203–528
Dynamic action, new rock structures produced by .... Bull 62, pp 206–208
Dynamic geology. See Degradation; Deposition; Diastrophism; Metamorphism; Volcanism.
Dynamic metamorphism in eruptive rocks .... Bull 62
Dynamic movements in the Leadville district, Colorado .... Ann 2, pp 211–214, 277
Dynamic movements in the Rocky mountain region .... Mon XII, pp 31–39
Eakins (L. G.), kaolin from the Waterfall mine, Colorado .... Bull 60, p 136
Eakins (L. G.), new analyses of astrophyllite and tscheffkinite ..... Bull 90, pp 41–44
Eakins (L. G.), seven new meteorites .... Bull 78, pp 91–97

Eakins (L. G.), triplite from the Black hills, Dakota ....Bull 60, pp 135-136
Eakins (L. G.), two new meteorites, description and analyses of....Bull 90, pp 45-46
Eakins (L. G.), two sulphantimonites from Colorado..............Bull 60, pp 115-117
Eakins (L. G.), xanthitane from North Carolina........................Bull 60, p 135
Earth, crust of the, elementary composition of the ....Bull 78, pp 35-42
Earth, rigidity of the, considerations concerning the, derived from a study of lake Bonneville ....Mon I, pp 387-392
Earthquake, the Charleston, of August 31, 1886..................Ann 9, pp 203-528
Earthquake waves, nature and mechanism of ....Ann 9, pp 400-409
Earthquakes and fault scarps ....Mon I, pp 360-362
Earthquakes in California in 1889 ....Bull 68
Earthquakes in California in 1890 and 1891 ....Bull 95
Earths, residuary, character and constitution of......................Ann 6, pp 239-251
Earthworms, action of, in producing soils ....Ann 12, I, pp 274-276
East Indies, tin production of the ....MR 1883-84, pp 621-622; MR 1885, p 377; MR 1888, p 215; MR 1889-90, p 121
Eastern sandstone, junction between the and the Keweenaw series of lake Superior...Bull 23
Eastern sandstone of the Penokee district, lake Superior........Mon XIX, pp 461-463
Echinodermata, description of species of, from the middle Cambrian of North America ....Bull 30, pp 94-95
Echinodermata from the Carboniferous of the Eureka district..Mon VIII, pp 212-213
Echinodermata, Mesozoic, of the United States.......................................Bull 97
Echinodermata of the higher Devonian of Ontario county, New York.........Bull 16, pp 25, 63
Echinodermata of the Olenellus zone ....Ann 10, I, p 607
Echinoidea of the United States ....Bull 97, pp 33-92
Eckart (W. R.), notes on mechanical appliances used in mining and milling on the Comstock lode ....Ann 1, pp 50-52
Educational series of rocks and bulletin to accompany the same, progress of the preparation of the.......................................Ann 12, I, pp 102-103
Efflorescence on sandstone from Cliff creek, Colorado, analysis of......Bull 60, p 170
Efflorescences, saline, of Lahontan basin............................Mon XI, pp 230-232
Egypt, fossil plants of, literature of the ....Ann 8, II, pp 800-802
Egypt, petroleum fields and wells of ....MR 1886, pp 478-480
Elæolite from Litchfield, Maine, analysis of.........................Bull 42, pp 28-29
Eldridge (G. H.), administrative report for 1890-91 ....Ann 12, I, pp 82-84
Electric peak and Sepulchre mountain, Yellowstone national park, the eruptive rocks of...Ann 12, I, pp 569-664
Electric (thermo-) measurement of high temperatures ....Bull 54
Electrical activity of ore bodies......Ann 2, pp 320-324; Mon III, pp 309-367, 400-404
Electrical and magnetic properties of the iron carburets..........................Bull 14
Electrical conductivity and resistance, measurement of............Bull 14, pp 36-38
Electrical conductivity and temperature, relation between.........Bull 14, pp 15-27
Electrical conductivity of mercury, the effect of pressure on the...Bull 92, pp 68-77
Electrical observation and assays of Eureka ore deposits........Mon VII, pp 142-144
Electrical pyrometers, calibration of.......................Bull 54, pp 84-125, 165-238
Electrical resistance and density, relation between, when varying with the temper of steel ....Bull 27, pp 30-50
Electrical resistance, strain, temper, and viscosity..................Bull 94, pp 31-33
Electrolysis in the metallurgy of copper, lead, zinc, and other metals.....MR 1882, pp 627-658
Electrolysis of their silver salts, the indirect estimation of chlorine, bromine, and iodine by the, with experiments on the convertibility of the silver salts by the action of alkaline haloids.....................Bull 42, pp 89-93

Electro-thermal measurement of high temperatures........Ann 4, pp 53-59; Bull 54
Elements, the chemical, the relative abundance of..................Bull 78, pp 34-42
Elevation and subsidence in cape Ann, Massachusetts, district, evidences of recent..Ann 9, pp 567-574
Elevation and subsidence in the Dismal swamp district........Ann 10, I, pp 328-332
Elevation and subsidence inferred from Cenozoic and Mesozoic rocks of Alabama..Bull 43, pp 136-138
Elevation of mount Desert island during and after the glacial period.....Ann 8, II. pp 1009-1034
Elevation of the northern sierras of California..................Ann 8, I, pp 426-432
Elevation of the piedmont region of California..................Ann 8, I, pp 425-426
Elevation of the surface of the Bonneville basin by expansion due to change of climate..Mon I, pp 425-426
Elevation. See, also, Altitudes; Diastrophism.
Elevations in the Dominion of Canada....................................Bull 6
Elevations in the United States, dictionary of......................Bull 5; Bull 76
Elk mountains, Archean and Algonkian rocks of the.................Bull 86, p 317
Elpasolite, a new mineral from El Paso county, Colo., description of....Bull 20, p 57
Embankments and terraces, the formation of.....................Ann 2, pp 171-172; Ann 3, pp 206-208; Mon I, pp 36, 46-58, 78-86; Mon XI, pp 88-89
Embudo gauging station, New Mexico, results of measurements at...........Ann 12, pp 257-258
Emeralds in North Carolina, the discovery of..................MR 1882, pp 500-502
Emeralds. See, also, Precious stones.
Emery and corundum, statistics of................MR 1882, pp 476-477; MR 1883-84, pp 714-720; MR 1885, pp 429-432; MR 1886, pp 585-586; MR 1887, pp 553-554; MR 1888, pp 577-578; MR 1889-90, p 457; MR 1891, 555-556
Emmons (E.), reprint of descriptions by, of flora from the Mesozoic of North Carolina..Mon VI, pp 97-123
Emmons (S. F.), administrative report for 1879-80..................Ann 1, pp 16-23
Emmons (S. F.), administrative report for 1880-81..................Ann 2, pp 18-21
Emmons (S. F.), administrative report for 1881-82..................Ann 3, pp 22-24
Emmons (S. F.), administrative report for 1882-83..................Ann 4, pp 34-39
Emmons (S. F.), administrative report for 1883-84..................Ann 5, pp 43-47
Emmons (S. F.), administrative report for 1884-85..................Ann 6, pp 62-67
Emmons (S. F.), administrative report for 1885-86..................Ann 7, pp 91-93
Emmons (S. F.), administrative report for 1886-87..............Ann 8, I, pp 144-146
Emmons (S. F.), administrative report for 1887-88..................Ann 9, pp 87-91
Emmons (S. F.), administrative report for 1888-89.............Ann 10, I, pp 137-140
Emmons (S. F.), administrative report for 1889-90...............Ann 11, I, pp 87-89
Emmons (S. F.), administrative report for 1890-91...............Ann 12, I, pp 96-99
Emmons (S. F.), geological sketch of Buffalo peaks, Colorado......Bull 1, pp 11-17
Emmons (S. F.), geology and mining industry of Leadville, Colorado........Ann 2, pp 201-290; Mon XII and atlas
Emmons (S. F.), quoted on the glaciers of mount Rainier.........Ann 5, pp 335-339
Emmons (S. F.), report of Tenth Census work.....................Ann 1, pp 60-65
Engineering operations for irrigation purposes.........................Ann 10, II, pp 37, 45-48, 78-108; Ann 11, II, pp 111-200
England. See Great Britain.
Engraving and printing, a division of, organized in the Geological Survey.....Ann 12, I, p 138
Enlargements of mineral fragments in certain detrital rocks of the northwestern states..Ann 5, pp 218-241
Enlargements, secondary, of mineral fragments in certain rocks..............Bull 8
Enstatite-bearing diabase from Colorado described.....................Bull 1, p 35
Eocene, bibliography of works relating to the....................Bull 83, pp 148-159

Eocene, boundaries of the........Bull 84, pp 20–21

Eocene; Brandon formation of Vermont, Pennsylvania, and Georgia..Bull 83, pp 90–94

Eocene; Cephalopoda from the marls of New Jersey........Mon XVIII, pp 284–288

Eocene; Chico-tejon series .....Ann 6, pp 68–70, 73; Bull 15, pp 11–17; Bull 19, pp 14, 17

Eocene; Chico-tejon series in Oregon and Washington, equivalents of the ......Bull 51, pp 28–32

Eocene; Chico-tejon series of California, description of fossils from the .....Bull 51, pp 11–27

Eocene, Dinocerata from the........Ann 5, pp 249–302; Mon x

Eocene formation in Virginia........Mon XV, p 59

Eocene formations of America, correlation of the........Bull 83

Eocene; fossil butterflies of Florissant, Colorado........Ann 8, I, pp 439–470

Eocene; Gasteropoda from the marl beds of New-Jersey ....Mon XVIII, p 190–239

Eocene in Alabama, Georgia, etc........Bull 43

Eocene in California........Mon XIII, pp 215–217, 299–300, 461; Bull 15; Bull 19

Eocene in Dakota........Bull 21

Eocene in Lassen peak district, California........Ann 8, pp 413–422

Eocene in northwestern Colorado ....Ann 9, pp 690–691

Eocene in Texas........Bull 45, pp 84–86

Eocene in the Grand canyon district ....Ann 2, pp 74–76; Mon II, pp 16, 27–31

Eocene in the Plateau region ....Ann 6, pp 140, 188–190

Eocene island of Florida........Bull 84, pp 181–182

Eocene; Laramie group of strata partly Cretaceous, partly Eocene......Bull 82, pp 127, 148; Bull 83, pp 132–134

Eocene; Laramie. See, also, Cretaceous; Laramie.

Eocene, marine, fresh-water Miocene, and other fossil Mollusca of western North America........Bull 18

Eocene marls of New Jersey, Lamellibranchiata from the........Mon IX, pp 222–242

Eocene Molluscan fauna of the Puget group........Bull 51, pp 49–63

Eocene; nonmarine fossil Mollusca of North America........Ann 3, pp 411–486

Eocene of Florida........Bull 84, pp 101–105

Eocene of Martha's vineyard........Ann 7, pp 326–328

Eocene of the United States, historical sketch of the literature of the......Bull 83, pp 17–37, 96–100, 112–131

Eocene; Oligocene, inapplicable of, in American nomenclature......Bull 83, pp 16, 89

Eocene; Ostreidæ of North America........Ann 4, pp 309–312

Eocene; phosphate deposits of South Carolina........Bull 46

Eocene; Puget group of deposits in Washington........Bull 83, pp 107–108

Eocene, Senonian, and Laramie plants, table of distribution of, and discussion thereof........Ann 6, pp 443–536

Eocene; Tėjon group of deposits in California, Oregon, and Washington......Bull 83, pp 100–106

Eocene, the succeeding fresh-water, and other groups, the relation of the Laramie Molluscan fauna to that of........Bull 34

Eocene. See, also, Tertiary.

Eolian sands in the Great basin........Mon XI, pp 153–156

Eolian soils........Ann 12, I, pp 326–329

Eparchean proposed as a name for a system of rocks between the Archean and the Paleozoic proper........Ann 7, pp 454–455; Bull 86, pp 148, 461–462

Epeirogeny. See Diastrophism.

Epidiorite from the Marquette region, Michigan........Bull 62, p 145

Epidote a product of mineralogical metamorphism........Bull 62, p 211

Epidote an alteration product of chlorite........Mon III, pp 75, 213, 370, 384

Epidote an alteration product of feldspar........Mon XII, pp 341, 357; Bull 28, pp 31–32; Bull 59, p 35; Bull 62, pp 108, 211

Epidote, circumstances favoring the formation of................Mon III, pp 211–213
Epidote not formed at the expense of feldspar......................Mon III, pp 76, 216
Epidotization a kind of mineralogical metamorphism....................Bull 62, p 56
Equilibrium, chemical, of solids, in its relation to pressure and to temperature..Bull 94, pp 109–135
Equiseteæ of the older Mesozoic of Virginia........................Mon VI, pp 10–18
Equiseteæ of the Potomac or younger Mesozoic..................Mon XV, pp 63–66
Equisetineæ from the Carboniferous basins of southwestern Missouri...........Bull 98, pp 17–43
Equus beds of Nebraska..Bull 84, pp 298–299
Equus beds and fauna, the age of the.........Mon I, pp 393–402; Bull 84, pp 283–285
Erinite from Utah ....Bull 55, pp 40–41
Erosion and deposition, glacial ....Ann 8, I, pp 355–369
Erosion, atmospheric...Ann 5, pp 75–76
Erosion by solution..Bull 84, pp 88–89
Erosion, elevation and, of the entire mountain and plateau region of the West in Tertiary time...Ann 6, pp 189–191
Erosion in Colorado.......................................Mon XII, pp 40–44, 126–128
Erosion in the driftless area of the upper Mississippi ....Ann 6, pp 221–239
Erosion phenomena on cape Ann, Massachusetts..................Ann 9, pp 556–567
Erosion, post-glacial, of Martha's vineyard ....Ann 7, pp 347–351
Erosion, rate of progress of...Ann 4, p 215
Erosion, the great, in the Grand canyon district.............................Ann 2, pp 95–103; Mon II, pp 61–77, 220–222, 250–260
Erosion, the tripartite, of the Great plains..........................Bull 57, pp 47–48
Erosion, transportation, and deposition, littoral..Mon I, pp 29–60; Mon XI, pp 87–99
Erosion. See, also, Degradation.
Erosional forms in the Hawaiian islands.............................Ann 4, pp 87–88
Eruptions in the Eureka district, Nevada, age of....................Mon XX, 231–232
Eruptive rocks, analyses of.....................Mon XII, pp 326, 332, 340, 349, 358, 589
Eruptive rocks, especially those of California, origin of the..Mon XIII, pp 164–175, 459
Eruptive rocks of Electric peak and Sepulchre mountain, Yellowstone national park ....Ann 12, I, pp 569–664
Eruptive rocks of the Mosquito range, Colorado...Mon XII, pp 74–89, 292–313, 322–354
Eruptive rocks of the Penokee series...........................Ann 10, I, pp 436–438
Eruptive rocks. See, also, Igneous rocks.
Española valley, New Mexico, irrigation in the ....Ann 12, II, pp 258–261
Ether, compressibility and thermal expansion of...................Bull 92, pp 28–30
Ettingshausen (Constantin, Freiherr von), biographical sketch of..Ann 5, pp 380–381
Eureka, Nevada, silver-lead deposits of.......................................Mon VII
Eureka district, Nevada, description and history of the ....Ann 1, pp 32–35, 38; Ann 2, pp 21–34; Mon VII, pp 1–4
Eureka district, Nevada, geological map of the ....Ann 3, pp 240–241; Mon XX, atlas sheet IV
Eureka district, Nevada, geology of the ....Ann 1, p 70; Ann 2, pp xviii–xx; Ann 3, pp 237–290; Mon XX and atlas
Eureka district, Nevada, mining geology of the.........Ann 4, pp 221–251; Mon VII
Eureka district, Nevada, paleontology of the........Mon VIII; Mon XX, pp 319–333
Europe, Cambrian rocks of, compared with those of America....Bull 81, pp 373–377
Europe, continent of, during the deposition of the sediment now forming the Olenellus zone ....Ann 10, I, pp 562–564
Europe, fossil plants of, literature of the...........................Ann 8, II, pp 672–785
Europe, lower Cambrian of, literature of the............Ann 10, I, pp 545–546, 577–581
Europe, quicksilver deposits of..............Ann 8, II, pp 965–966; Mon XIII, pp 27–43
Europe. See, also, the various countries thereof.

Eutectic substances in relation to rock magmas........................Bull 66, p 27

Evaporation measurements ....Ann 11, II, pp 30-34; Ann 12, II, pp 234-235

Everglades of Florida..Bull 84, pp 99-101

Expansion, thermal, of certain rocks, preliminary note on the coefficients of...Bull 78, pp 109-118

Fallacies, popular, regarding precious-metal ore deposits.........Ann 4, pp 253-271

Fault and monocline at Nutria, New Mexico..........................Ann 6, pp 142-145

Fault at margin of Eastern sandstone, lake Superior district.....Ann 3, pp 152-155

Fault basins in western United States............................Mon XI, pp 25-27

Fault between Keweenaw series and Eastern sandstone......................Bull 23

Fault, throw, hade, strike, etc., defined.............................Ann 4, p 442

Faulting and uplifting of the Sierras, relation of, to volcanic phenomena......Ann 8, I, pp 426-430

Faulting in the Connecticut valley.......................Ann 7, pp 469-477, 481-490

Faulting in the Great basin.....................................Mon I, pp 340-362

Faulting of the Sierra nevada, age of the..........................Bull 33, pp 15-16

Faulting, structural results of, on the Comstock lode, a discussion of the principles involved............Ann 2, pp 300-304; Mon III, pp 156-187, 376-380

Faulting. See, also, Diastrophism.

Faults and faulting, topography in the Great basin due to.........Ann 4, pp 443-450

Faults and flexures of the Penokee district.....................Mon XIX, pp 437-441

Faults and folds of the Grand canyon district....Ann 2, pp 117-118, 124-126, 132-133; Mon II, pp 13, 19-22, 93-94, 112-117, 122-123, 162-163, 177, 183-186, 191-192, 205, 228

Faults and folds of the Mosquite range region, Colorado..........Ann 2, pp 213-214, 244-252, 265-268; Mon XII, pp 284-292

Faults and undulations of the Tertiary and Cretaceous strata of Alabama......Bull 43, 117-132

Faults, classification of...Ann 7, pp 469-481

Faults in the copper district of lake Superior.....................Mon V, pp 205, 219, 258-259, 361-365, 416-417

Faults in the Eureka mining district, Nevada...........Ann 3, pp 288-289; Mon VII, pp 20, 24-35, 38-40, 46-50, 170, 180-183; Mon XX, pp 14-19, 100-101, 159-160, 210-217

Faults in the lake Lahontan basin.......................Mon XI, pp 163-166, 275-283

Faults of Kilauea, Hawaiian islands..............................Ann 4, pp 121-122

Fauna, Molluscan, from the Puget sound region.....................Bull 51, pp 49-63

Fauna of the Braintree, Massachusetts, argillites..................Bull 10, pp 43-49

Fauna of the lower Cambrian or Olenellus zone................Ann 10, I, pp 509-763

Fauna of the St. John formation contained in the Hartt collection at Cornell university, review of the.....................................Bull 10, pp 9-42

Fauna, the Laramie Molluscan, the relation of the, to that of the succeeding fresh-water Eocene and other groups......................................Bull 34

Fauna, vertebrate, in America, section to illustrate......................Mon X, p 7

Faunas, lists of species of the upper Devonian, of the Genesee section, New York..Bull 41, pp 31-102

Faunas, on the fossil, of the upper Devonian from Tompkins county, New York, to Bradford county, Pennsylvania...................................Bull 3

Faunas, on the fossil, of the upper Devonian of the Genesee section, New York..Bull 41

Faunas, recent, of different temperature zones, tables showing the number of shell-bearing marine species of mollusks contained in............Bull 84, p 26

Faunas, the Cambrian, of North America, studies of..............Bull 10; Bull 30

Faunas, the higher Devonian, of Ontario county, New York..................Bull 16

Fayalite from the Yellowstone national park, analysis of...Ann 7, p 272; Bull 27, p 63

Fayalite in lithophysæ, Yellowstone national park.......................Ann 7, p 270

Fayalite, origin of, in rhyolite .... Ann 7, pp 279-283

Features, topographic, of lake shores .... Ann 5, pp 69-123

Feldspar a product of mineralogical metamorphism .... Bull 62, p 209

Feldspar, alteration of, to zeolite .... Bull 28, pp 52-53

Feldspar, altered, from Laurel creek, Georgia, analysis of .... Bull 42, p 138

Feldspar determinations by Szabó's method .... Mon III, pp 405-408

Feldspar, epidote an alteration product of .... Mon XII, pp 341, 357; Bull 28, pp 31-32; Bull 59, p 35; Bull 62, pp 108, 211

Feldspar fragments, enlargements of, in certain Keweenawan sandstones .... Bull 8, pp 44-47

Feldspar from a typical Brandywine gabbro, analysis of .... Bull 59, p 12

Feldspar, progress of alteration of, during metamorphism of massive rocks .. Bull 62, pp 214-216

Feldspar, secondary enlargement of, in sandstones .... Ann 5, pp 237-240; Bull 8, p 44

Feldspar, statistics of .... MR 1883-84, pp 933-934; MR 1885, p 523; MR 1886, p 701; MR 1887, pp 5, 6, 8-9; MR 1888, pp 6, 8, 10-11; MR 1889-90, p 6; MR 1891, pp 474, 500

Feldspar yields biotite and quartz on decomposition in granite ...... Ann 10, I, p 355

Feldspars from Delaware, analyses of .... Bull 55, pp 79-80

Feldspars from Hoosac tunnel and Greylock mountain, Massachusetts, analyses of .... Bull 55, p 79

Feldspars from Minnesota gabbros, analyses of .... Bull 78, p 122

Feldspars from the Penokee district of Michigan and Wisconsin, analyses of .... Mon XIX, p 352

Feldspathic magma in the Eureka district, Nevada .... Mon XX, p 255

Feldspathic rocks, thermal effect of the action of aqueous vapor on .... Ann 2, pp 325-330; Mon III, pp 290-308, 397-400

Felsite of the Keweenaw series described .... Mon V, pp 95-112

Fernandan system of rocks of Texas .... Bull 86, pp 267-269

Ferric sulphates, basic, analyses of .... Mon XII, p 550

Ferro-magnesian minerals in rocks, decomposition of .... Mon III, p 384

Fertilizer trade in North Carolina in 1886 .... MR 1886, pp 611-617

Fertilizers, analyses of .... MR 1883-84, pp 816-819, 821; MR 1885, pp 471-473; MR 1887, pp 593-594

Fertilizers, statistics of .... MR 1882, pp 504-531; MR 1883-84, pp 783-826; MR 1885, pp 445-473; MR 1886, pp 606-627; MR 1887, pp 580-594; MR 1888, pp 586-596; MR 1889-90, pp 449-455; MR 1891, pp 557-563

Filices of the Dakota group .... Mon XVII, pp 24-25

Filices of the older Mesozoic of Virginia .... Mon VI, pp 18-63

Filices of the Potomac or younger Mesozoic .... Mon XV, pp 66-166

Filicineæ from the Carboniferous basins of southwestern Missouri .... Bull 98, pp 43-103

Filtration by means of easily soluble and easily volatile filters ..... Bull 27, pp 27-29

Fisher (F. R.), account of the Charleston earthquake by .... Ann 9, pp 242-247

Fishes, fossil, descriptions of genera and species of, from the Triassic rocks of New Jersey and the Connecticut valley .... Mon XIV, pp 24-76

Fishes, fossil, description of two species of, from the upper Devonian of New York .... Bull 41, pp 62-63

Fishes, fossil, of the Newark system .... Bull 85, pp 56-58, 125

Fishes of the Carboniferous of North America .... Mon XVI, pp 75-228

Fishes of the Devonian of North America .... Mon XVI, pp 21-74

Fishes of the higher Devonian of Ontario county, New York .. Bull 16, pp 17-20, 40-43

Fishes of the upper Silurian of North America .... Mon XVI, pp 17-20

Flexures and faults of the Penokee district .... Mon XIX, pp 437-441

Flexures. See, also, Faults.

Flood plains and flood-plain soils .... Ann 12, I, pp 288-293
Flora, fossil, geographical distribution of .... Ann 8, II, pp 663-960
Flora, fossil, of the Dakota group .... Mon XVII
Flora of the Laramie group, synopsis of the .... Ann 6, pp 399-557
Flora of the outlying Carboniferous basins of southwestern Missouri .... Bull 98
Flora, older Mesozoic, of North Carolina .... Mon VI, pp 97-128
Flora, older Mesozoic, of Virginia .... Mon VI
Flora, Potomac or younger Mesozoic .... Mon XV
Flora, types of the Laramie .... Bull 37
Floras and faunas, the higher Devonian, in Ontario county, New York .... Bull 16
Florida, altitudes in .... Bull 5, p 78; Bull 76
Florida, boundary lines of .... Bull 13, pp 101-102
Florida, clay deposits and industry of .... MR 1891, p 507
Florida, coral, coral rocks, and coquina gravels from, analyses of .. Bull 60, pp 162-163
Florida, Eocene deposits in .... Bull 83, pp 55-57, 82, 87
Florida, geologic and paleontologic investigations in ..... Ann 6, p 74; Ann 8, p 182; Ann 9, pp 73-74, 124; Ann 10, I, 119, 167; Ann 11, I, pp 67, 102, 111; Ann 12, I, pp 28, 52-53, 55, 71, 75, 82-84, 117
Florida, geologic map of .... Bull 84, pp 156-157
Florida, geologic maps of, listed .... Bull 7, p 112
Florida, mineral springs of .... Bull 32, pp 85-87; MR 1891, pp 603, 604
Florida, minerals of, the useful .... MR 1882, p 675; MR 1887, pp 719-720
Florida, phosphate deposits of .... Bull 46, pp 78-79; MR 1883-84, 793-794; MR 1885, pp 450-453; MR 1886, pp 617-618; MR 1888, pp 592-593; MR 1889-90, pp 451-454; MR 1891, p 562
Florida, stratigraphy of .... Bull 84, pp 101-158
Florida, topographic work in .... Ann 11, I, p 38
Florida; water from surface drainage at St. Augustine, analysis of .... Bull 60, p 171
Florida; waters from two artesian wells at St. Augustine, analyses of ... Bull 64, p 59
Florida peninsula, topography of the .... Bull 84, pp 86-101
Floridas, purchase of the, from Spain .... Bull 13, p 21
Florissant, Colorado, fossil butterflies of .... Ann 8, I, pp 433-474
Florissant, Colorado, and other points in the Tertiaries of Colorado and Utah, some insects of special interest from .... Bull 93
Fluid inclusions in minerals of igneous rocks, secondary origin of .... Mon III, pp 79, 119, 371
Fluid volume, its dependence on pressure and temperature .... Bull 92, pp 17-67
Fluorspar, statistics of ...... MR 1882, p 587; MR 1885, p 518; MR 1886, pp 692-693; MR 1887, p 659; MR 1889-90, pp 468-473; MR 1891, p 586
Folding in the region of the Uinta and Park ranges .... Ann 9, pp 692-706
Folding. See, also, Faulting.
Fontaine (W. M.), administrative report for 1884-85 .... Ann 6, pp 85-86
Fontaine (W. M.), administrative report for 1887-88 .... Ann 9, pp 132-133
Fontaine (W. M.), administrative report for 1888-89 .... Ann 10, I, p 174
Fontaine (W. M.), administrative report for 1890-91 .... Ann 12, I, p 125
Fontaine (W. M.), older Mesozoic flora of Virginia .... Mon VI
Fontaine (W. M.), the Potomac or younger Mesozoic flora .... Mon XV
Footprints in the Newark strata .... Bull 85, pp 61-62
Forest areas in the arid region of the United States, maps showing .. Ann 11, II, pp iv-v
Forestry investigations in the Appalachian region ...... Ann 5, pp 64-66; Ann 6, p 93; Ann 7, pp 135-136; Ann 8, I, pp 201-202
Forestry of India .... Ann 12, II, pp 404-405
Forests within the arid region of the United States, their area, timber, destruction, etc .... Ann 11, II, pp 206-208
Formulas and tables to facilitate the construction and use of maps .... Bull 50

Fort Ellis beds of Montana........Bull 84, p 287
Fort Union beds, correlation of the........Bull 83, pp 114–130, 135
Fossil butterflies of Florissant, Colorado........Ann 8, I, pp 433–474
Fossil faunas of the upper Devonian, the Genesee section, New York........Bull 41
Fossil fishes and fossil plants of the Triassic rocks of New Jersey and the Connecticut valley........Mon XIV
Fossil insects, a classed and annotated bibliography of........Bull 69
Fossil insects, including myriapods and arachnids, systematic review of our present knowledge of........Bull 31
Fossil insects of the world, index to the known, including myriapods and arachnids........Bull 71
Fossil Mollusca, marine Eocene, fresh-water Miocene, and other, in North America........Bull 18
Fossil Mollusca, nonmarine, of North America........Ann 3, pp 403–550; Bull 18, pp 17–19
Fossil Ostreidæ of North America........Ann 4, pp 273–430
Fossil plants, geographical distribution of........Ann 8, pp 663–960
Fossil wood and lignite of the Potomac formation........Bull 56
Fossiliferous deposits of Nantucket........Bull 53, pp 28–42
Fossils from California, new Cretaceous........Bull 22
Fossils from the Carboniferous limestone of California........Bull 33, p 11
Fossils from the great Sioux reservation, Dakota........Bull 21, p 11
Fossils from the sediments and tufa deposits of lake Lahontan....Mon XI, pp 238–249
Fossils, invertebrate, from the Pacific coast........Bull 51
Fossils, Mesozoic........Bull 4
Fossils, Mesozoic, types of, from the Texan Permian........Bull 77
Fossils of the Cambrian, Silurian, Devonian, and Carboniferous formations of the Eureka district, Nevada........Mon VIII; Mon XX, pp 319–333
Fossils, Quaternary, and recent forms from American localities between cape Hatteras and cape Roque........Bull 24
Fossils, the use of, in classification and correlation of strata........Ann 7, pp 372–377; Ann 11, I, pp 273–275
Fossils. See, also, Invertebrates; Paleobotany; Paleontology; Vertebrates.
France, antimony production of........MR 1883–84, p 645
France, Cambrian rocks of, correlated with those of Wales........Ann 10, I, p 581
France, coal area and output of, compared with those of other countries...MR 1882, p 5; MR 1883-84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73
France, copper production of........MR 1882, p 256; MR 1883–84, pp 371–372; MR 1885, p 241; MR 1886, pp 138–139; MR 1888, pp 73, 77; MR 1889–90, p 77
France, fossil plants of, literature of the........Ann 8, II, pp 689–702
France, iron and steel production of, compared with that of other countries....MR 1882, p 109; MR 1883–84, p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889–90, p 21; MR 1891, pp 46, 73
France, lead production of........MR 1883–84, pp 434, 439; MR 1885, pp 264, 271
France, manganese production of........MR 1888, p 141; MR 1889–90, p 130
France, mining law of........MR 1883–84, p 998
France, phosphorites and phosphates of........Bull 46, pp 48–53, 107–112
France, pyrites mines of........MR 1883–84, p 885
France, quicksilver occurrences in........Mon XIII, pp 32–33
France, tin deposits in........MR 1883–84, p 617
France, zinc production of........MR 1883–84, pp 480, 488; MR 1885, pp 277, 282; MR 1886, p 159; MR 1887, p 117; MR 1888, p 95; MR 1889–90, p 92; MR 1891, pp 113, 114
Freshening of lakes by desiccation........Ann 2, pp 177–180; Ann 3, pp 224–230; Mon I, pp 208–209, 229, 258; Mon XI, pp 224–230

range, Colo., literature of the geology of...Bull 86, pp 308–313, 314–315, 325, 506
ite from mount Lincoln, Colorado ....Mon XII, p 111
ite from Whiteside county, Illinois, analysis of..................Bull 42, p 140
oles in Mono valley, California ....Ann 8, I, p 372
-diorite from Delaware, description of..................Bull 59, pp 15–19
-diorite from near Baltimore, Maryland, description of......Bull 28, pp 27–32
-granite from Delaware....................................Bull 59, pp 19–21
, hornblende-, of the Keweenaw series, description of ....Mon V, pp 56–58
, olivine-, of the Keweenaw series, description of ....Mon V, pp 37–50
, orthoclase-bearing, of the Keweenaw series, description of..Mon V, pp 50–56
s and associated hornblende rocks near Baltimore, Maryland..........Bull 28
s and associated rocks in Delaware ....Bull 59
s, genetic relationships of, in Delaware......................Bull 59, pp 40–43
ite from Llano county, Texas, analysis of.........................Bull 64, p 40
from Montgomery county, Maryland, analysis of................Bull 9, p 9
and cerussite, relative richness of ....Mon XII, pp 553–556
and pyrite, alteration products of, analyses of..............Mon XII, p 606
group of rocks of New Mexico ....Bull 84, pp 301–303
river basin, hydrography of ....Ann 11, II, pp 38–39, 93
c, thermo-electric, and magnetic properties of wrought iron, steel, and
st iron in different states of hardness.................................Bull 14
take of the Laramie flora ....Bull 37, pp 104–115
(H.), administrative report for 1882–83.......................Ann 4, pp 3–16
(H.), administrative report for 1883–84.......................Ann 5, pp 3–14
(H.), administrative report for 1884–85.......................Ann 6, pp 3–17
(H.), administrative report for 1885–86 ....Ann 7, pp 45–60
(H.), administrative report for 1886–87 ....Ann 8, I, pp 97–120
(H.), administrative report for 1887–88.......................Ann 9, pp 49–67
(H.), administrative report for 1888–89..................Ann 10, I, pp 83–105
(H.), administrative report for 1889–90...................Ann 11, I, pp 33–48
(H.), administrative report for 1890–91...................Ann 12, I, pp 23–42
(H.), boundaries of the United States and of the several states and territories, with a historical sketch of the territorial changes............Bull 13
(H.), corundum and emery..........................MR 1882, pp 476–477
(H.), dictionary of altitudes in the United States....................Bull 5
(H.), dictionary of altitudes in the United States, second edition...Bull 76
pessartite, from Llano county, Texas, description and analysis of......Bull 90, pp 39–40
See, also, Precious stones.
umulation, conditions and modes of..................................Ann 8, II, pp 507–519; Ann 11, I, pp 654–661
oil production, geological factors in.....................Ann 8, II, pp 581–589
petroleum, theories respecting the origin of.............Ann 8, II, pp 485–506
elated bitumens, the origin, constitution, future, etc., of............Ann 11, I, pp 589–616
nmable, and petroleum in Ohio and Indiana, the Trenton limestone
source of...Ann 8, II, pp 475–662
ral, analyses of.............Ann 8, II, pp 591, 592, 646; MR 1888, pp 490, 510
ral, history of the use of, in the United States.........MR 1885, pp 169–173
ral, in Japan...MR 1888, pp 511–512
ral, statistics of..................................MR 1883–84, pp 233–245; MR 1885, pp 155–179; MR 1886, pp 488–516; MR 1887, pp 464–502; MR 1888, pp 481–512; MR 1889–90, pp 366–372; MR 1891, pp 436–451
ral, storage and pumping of...........................MR 1891, pp 441–443
ral, the Indiana field...................................Ann 11, I, pp 579–742

Gas, natural, total consumption of, in the United States........MR 1888, pp 481–486; MR 1889–90, p 366; MR 1891, p 438

Gas, natural, transportation of..................................MR 1886, pp 493–496

Gas pressure and measurement...........Ann 8, II, pp 593–603; Ann 11, I, pp 662–675

Gas rocks, analyses of..........................Ann 8, II, pp 553–556, 641–643, 654, 662

Gas wells, care of..Ann 11, I, pp 741–742

Gas wells, pressure and production of..............................MR 1886, pp 491–492

Gases, viscosity of...Bull 54, pp 239–306

Gasteropoda, description of species of the middle Cambrian of North America...Bull 30, pp 125–131

Gasteropoda, nonmarine fossil, of North America..................Ann 3, pp 443–471

Gasteropoda of the Carboniferous of the Eureka district, Nev..Mon VIII, pp 254–263

Gasteropoda of the Devonian of the Eureka district, Nevada...Mon VIII, pp 182–196

Gasteropoda of the Eocene..Bull 83

Gasteropoda of the Great basin......................................Bull 11, pp 16–22

Gasteropoda of the higher Devonian of Ontario county, New York...........Bull 16, pp 22–23, 52–55

Gasteropoda of the lower Silurian of the Eureka district, Nevada..Mon VIII, pp 78–84

Gasteropoda of the Olenellus zone.................................Ann 10, I, pp 616–619

Gasteropoda, table showing number of, occurring in the several marl beds of New Jersey, genera and species under each family.............Mon XVIII, p 26

Gasteropoda and Cephalopoda of the Raritan clays and greensand marls of New Jersey...Mon XVIII

Gasteropods and cephalopods from the New Jersey Cretaceous recognized at other localities, table showing...................................Mon XVIII, p 30

Gaylussite, analysis of..Mon XI, p 76

Gaylussite, occurrence of, in soda lakes..................................Mon XI, p 76

Gaylussite pseudomorphs, relation of the Lahontan thinolite to....Bull 12, pp 25–28

Gearksutite from near Pike's peak, Colorado, general description and chemical investigation of...Bull 20, pp 58–62

Geinitz (Hans Bruno), biographical sketch of..............................Ann 5, p 374

Gems and precious stones, American..........................MR 1882, pp 4; 483–499

Gems, statistics of...................MR 1882, pp 482–503; MR 1883–84, pp 723–782; MR 1885, pp 437–444; MR 1886, pp 595–605; MR 1887, pp 555–579; MR 1888, pp 580–585; MR 1889–90, pp 445–448; MR 1891, pp 539–551

Genesee section, New York, fossil faunas of the upper Devonian..............Bull 41

Genth (F. A.), the minerals of North Carolina..................................Bull 74

Geographic distribution of fossil plants..........................Ann 8, II, pp 663–960

Geographic work. See Topographic work.

Geoid, form and position of the........................Mon I, pp 421–424; Bull 48

Geologic folios prepared by the Geological Survey. See pp. 305–306 of this bulletin.

Geologic investigations in the various states and territories. See each state and territory.

Geologic map of the United States, plan for the...................Ann 8, I, pp 74–76

Geologic maps of portions of the United States and of the world. See entries under "Map, geologic," in this index, pp. 410–416.

Geologic nomenclature and map notation, conference of geologists and lithologists on, in January, 1889...Ann 10, I, pp 56–67

Geological survey, laws establishing and extending the..Ann 1, pp 3–4; Ann 4, p xiii

Geological survey, plan and organization of the.......................Ann 1, pp 6–14; Ann 7, pp 3–17; Ann 8, I, pp 3–69

Geology and topography of India..............................Ann 12, II, pp 399–403

Geomorphic geology, domain and processes of....................Ann 11, I, pp 244–273

Georgia, altitudes in...................................Bull 5, pp 79–83; Bull 76

Georgia, boundary lines of, and cession by, of territory to general government..Bull 13, pp 27, 97–100

brick industry of......................MR 1887, pp 535, 537; MR 1888, p 558
building stone from, statistics of......................MR 1882, pp 451, 452; MR 1886, p 542; MR 1887, pp 514, 518; MR 1888, pp 536, 538, 541, 543; MR 1889–90, pp 374, 386–388; MR 1891, pp 457, 458
ambrian rocks of, correlation of the..............................Bull 81, pp 144–146, 155, 303–305, 383–384
coal area and statistics of..Ann 2, p xxviii; MR 1883–84, pp 12, 39; MR 1885, pp 11, 26; MR 1886, pp 225, 230, 252; MR 1887, pp 169, 223; MR 1888, pp 169, 171, 240–241; MR 1889–90, pp 146, 194; MR 1891, p 218
oke in, manufacture of..MR 1883–84, p 160; MR 1885, pp 80, 89; MR 1886, pp 378, 384, 393–394; MR 1887, pp 383, 389, 397–398; MR 1888, pp 395, 400, 408; MR 1891, pp 360, 366, 378
opper mines and statistics of................Ann 2, p xxix; MR 1882, p 231
orundum deposits and statistics of.............MR 1883–84, pp 715, 716–717; MR 1885, p 429; MR 1886, p 585; MR 1887, p 553; MR 1888, p 577; MR 1889–90, p 457; MR 1891, p 555
ocene deposits in..................................Bull 83, p 54–55, 82, 87
feldspar, altered, from Laurel creek, analysis of.............Bull 42, p 138
ossils from..........................Ann 4, pp 296, 297, 311; Ann 8, II, p 878
eologic investigations in.......................Ann 6, p 24; Ann 7, p 114; Ann 9, pp 78, 122; Ann 10, I, p 120; Ann 12, I, p 54, 71, 79, 117
eologic maps of, listed ....Bull 7, pp 102, 103
old from, statistics of.........................Ann 2, p 385; MR 1882, pp 172, 176, 177, 178; MR 1883–84, pp 312, 313; MR 1885, p 201; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 77, 78, 79
on and steel from, statistics of................Ann 2, p xxviii; MR 1882, pp 120, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, pp 252, 278; MR 1885, pp 182, 184; MR 1886, pp 18, 33, 84–85, 98; MR 1887, p 11; MR 1888, pp 14, 23; MR 1889–90, pp 10, 17, 24, 32, 35; MR 1891, pp 12, 26, 54, 55, 61
anganese deposits in....................MR 1882, pp 424, 425; MR 1883–84, p 552; MR 1885, pp 305, 328–332; MR 1886, pp 181, 185–188; MR 1887, pp 145, 146, 150–151; MR 1888, pp 124, 125, 127; MR 1889–90, pp 127, 133–134; MR 1891, pp 127, 128, 133–134
anganese ore from, analysis of..............................MR 1891, p 134
arble from Pickens county, analysis of..................MR 1889–90, p 387
arble production of ....MR 1891, pp 468, 469
argarite from near Gainesville, description and analysis of....Bull 9, p 11
ineral springs of....................Bull 32, pp 81–85; MR 1883–84, p 981; MR 1885, p 537; MR 1886, p 716; MR 1887, p 683; MR 1888, p 626; MR 1889–90, p 526; MR 1891, pp 603, 604
inerals of, the useful............MR 1882, pp 675–677; MR 1887, pp 720–722
ocene beds of..Bull 84, pp 81–85
hre production of.......................................MR 1891, p 595
rites from............................MR 1883–84, p 880; MR 1885, p 506
yrolusite from the Etowah region, analyses of..........MR 1883–84, p 552
te production of...MR 1891, p 472
pographic work in................Ann 6, p 9; Ann 7, p 52; Ann 8, I, p 102; Ann 9, p 53; Ann 10, I, pp 91, 92; Ann 11, I, p 37; Ann 12, I, p 24
aters from Savannah, analyses of.............Bull 55, p 91; Bull 64, p 59
l Alabama, waters from artesian wells in, analyses of........Bull 55, p 91
ntimony production of.........................MR 1883–84, pp 645–646
al area and output of, compared with those of other countries..MR 1882, p 5; MR 1883–84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73

Germany, copper production of .... MR 1882, pp 255–256; MR 1883–84, pp 356, 368–370; MR 1885, pp 228, 238–240; MR 1886, pp 128, 135–138; MR 1887, p 87; MR 1888, p 73; MR 1889–90, p 73; MR 1891, p 100

Germany, fossil plants of, literature of the .... Ann 8, II, pp 744–775

Germany, gold and silver production of, compared with that of other countries .... MR 1883–84, pp 319, 320; MR 1889–90, p 49

Germany, iron and steel production of, compared with that of other countries .... MR 1882, p 109; MR 1883–84, p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889–90, pp 20, 21, 22; MR 1891, pp 46, 73

Germany, lead production of .... MR 1882, pp 322–323; MR 1883–84, pp 434, 436–438; MR 1885, pp 264, 267–268

Germany, manganese production of .... MR 1886, p 201; MR 1887, p 161

Germany, mining law of .... MR 1883–84, pp 992–996, 1001

Germany, nickel production of .... MR 1882, pp 406, 410; MR 1883–84, p 540

Germany, pyrites mines of .... MR 1883–84, p 885

Germany, quicksilver deposits of .... Mon XIII, pp 36–37

Germany, salt production of .... MR 1883–84, p 819

Germany, tin production of .... MR 1883–84, p 618

Germany, zinc production of ...... MR 1882, pp 356–357; MR 1883–84, pp 480, 481–486; MR 1885, pp 277–280; MR 1886, p 159; MR 1887, p 117; MR 1888, pp 95, 96

Geyser basin, upper, of the Firehole river, Yellowstone national park .... Ann 9, pp 651–668

Geyser waters, analyses of .... Ann 9, p 655

Geyserites from Rotorua, New Zealand, analyses of .... Bull 64, p 45

Geysers of the Yellowstone national park .... Ann 9, p 628

Gignoux (J. E.), the manufacture of bluestone at the Lyon mill, Dayton, Nevada .... MR 1882, pp 297–305

Gila river basin, Arizona, hydrography of the .... Ann 11, II, pp 58–63, 100, 108; Ann 12, II, pp 292–316

Gila river basin, Arizona, irrigation problems relating to the .. Ann 11, II, pp 227–229

Gilbert (G. K.), administrative report for 1879–80 .... Ann 1, pp 23–28

Gilbert (G. K.), administrative report for 1880–81 .... Ann 2, pp 10–17

Gilbert (G. K.), administrative report for 1881–82 .... Ann 3, pp 14–16

Gilbert (G. K.), administrative report for 1882–83 .... Ann 4, pp 19–21

Gilbert (G. K.), administrative report for 1883–84 .... Ann 5, pp 30–34

Gilbert (G. K.), administrative report for 1884–85 .... Ann 6, pp 22–25

Gilbert (G. K.), administrative report for 1885–86 .... Ann 7, pp 65–68

Gilbert (G. K.), administrative report for 1886–87 .... Ann 8, I, pp 128–132

Gilbert (G. K.), administrative report for 1887–88 .... Ann 9, pp 76–78

Gilbert (G. K.), administrative report for 1888–89 .... Ann 10, I, pp 108–113

Gilbert (G. K.), administrative report for 1889–90 .... Ann 11, I, pp 49–62

Gilbert (G. K.), administrative report for 1890–91 .... Ann 12, I, pp 52–65

Gilbert (G. K.), lake Bonneville, geological history of ..... Ann 2, pp 167–200; Mon I

Gilbert (G. K.), new method of barometric hypsometry .... Ann 2, pp 403–566

Gilbert (G. K.), sketch of the Quaternary lakes of the Great basin .. Bull 11, pp 9–12

Gilbert (G. K.), topographic features of lake shores .... Ann 5, pp 69–123

Gill (D. W.), administrative report for 1889–90 .... Ann 11, I, pp 133–134

Gill (D. W.), administrative report for 1890–91 .... Ann 12, I, pp 136–138

Glacial action in New England, the effects of, in the development of shore swamps .... Ann 6, pp 362–363

Glacial action in perturbing drainage so as to produce swamps .... Ann 10, I, pp 295–303

Glacial action, land forms produced by .... Ann 11, I, pp 249–256

Glacial action on mount Desert, Maine .... Ann 8, II, pp 1002–1009

Glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana, and Illinois .... Bull 58
Glacial clays from Milwaukee, Wisconsin, analyses of .... Ann 6, p 250
Glacial dam at Cincinnati, hypothesis of a .... Bull 58, pp 76–101
Glacial deposits of Martha's vineyard .... Ann 7, pp 308–325
Glacial deposits of the middle Atlantic slope .... Ann 7, p 611
Glacial epoch; driftless area of the upper Mississippi valley .... Ann 6, pp 199–322
Glacial epoch, second, terminal moraine of the .... Ann 3, pp 291–402
Glacial epoch, the Quaternary lakes of the Great basin regarded as the contemporaries of the .... Ann 2, pp 187, 189
Glacial epochs, rock-scorings of the .... Ann 7, pp 147–248
Glacial epochs. See, also, Pleistocene.
Glacial history and phenomena of northeastern Iowa .... Ann 11, I, pp 472–577
Glacial history of the Mono basin, California .... Ann 8, I, pp 321–371
Glacial lake Agassiz, upper beaches and deltas of the .... Bull 39
Glacial masses, modification of sea level by the attraction of .... Bull 48, pp 60–79
Glacial movement, changes of, and cross-striation .... Ann 7, pp 200–207
Glacial movement, temperature and saturation as affecting .... Ann 7, pp 186–187
Glacial period, character and effect of the, in the Grand canyon district .... Mon II, pp 228–229
Glacial phenomena in Colo ... Ann 2, pp 228–230; Mon XII, pp 29–30, 41–42, 92, 126–128
Glacial phenomena on cape Ann, Massachusetts .... Ann 9, pp 546–559
Glacial phenomena on Nantucket .... Bull 53, pp 15–28, 42–47
Glacial phenomena. See, also, Drift; Loess.
Glacial striæ of the eastern United States, map of the .... Ann 17, pp 154–155
Glacial theory as to the Newark system .... Bull 85, pp 47–53
Glacial theory, origin and history of the .... Ann 11, I, pp 280–291
Glaciation, changes in river courses in Washington territory due to .... Bull 40
Glaciation, correlation of lake maxima with .... Mon I, pp 265–283
Glaciation, evidence of, in the Yosemite valley .... Ann 10, I, pp 142–143
Glaciation, how affected by change in solar energy .... Mon I, pp 283–297
Glaciation in relation to soils .... Ann 12, I, 235–239, 268
Glacier, what is a? .... Ann 5, pp 309–313
Glaciers, almost total absence of, in the northern half of the Great basin during Quaternary time .... Ann 4, pp 463–464
Glaciers, ancient, of the Sierra nevada .... Ann 5, pp 327–328
Glaciers, existing and Quaternary, of the high sierra in Cal .... Ann 8, I, pp 324–346
Glaciers, existing, of the United States .... Ann 5, pp 303–355
Glaciers, former and existing, of the Sierra nevada, topographical sketch of .... Ann 5, pp 310–311
Glaciers of Alaska .... Ann 5, pp 348–355
Glaciers, testimony of, regarding the Quaternary climate of the Great basin .... Mon XI, pp 265–268
Glass and steel, the effect of sudden cooling exhibited by .... Bull 42, pp 98–131
Glass materials, statistics of .... MR 1883–84, pp 958–977; MR 1885, pp 544–557
Glass sands, analyses of .... MR 1883–84, p 962
Glass, stressed, the electrical resistance of .... Bull 94, pp 85–100
Glass, the viscosity of electrolyzing .... Bull 94, pp 80–84
Glass, thermal expansion and compressibility of .... Bull 96, pp 54–55
Glaucophane in metamorphic rocks of the Coast ranges of California .. Mon XIII, p 76
Glaucophane schists of the Coast ranges of California .... Mon XIII, pp 102–104
Gneiss, Archean, of northern Wisconsin .... Ann 10, I, pp 358–362
Gneiss dunyte contacts of Corundum hill, North Carolina, in relation to the origin of corundum .... Bull 42, pp 45–63

Gneiss of the Mosquito range, Colorado, description of the........Mon XII, pp 48-50

Gneisses of the lake Superior district, character of the..........Ann 10, I, pp 358-360

Gogebic series. See Penokee series.

Gold; auriferous gravels of California..........................Bull 84, pp 219-222

Gold; auriferous slate series of Lassen peak district, Cal.......Ann 8, I, pp 404-407

Gold, colloidal sulphides of.....................................Bull 90, pp 56-61

Gold deposits in the Leadville district, Colo....Mon XII, pp 376, 513-518, 545, 579, 594

Gold, discovery of, in California and Nevada......................Mon IV, pp 1-14

Gold in the deposits of Eureka, Nevada......Mon VII, pp 120, 131-132, 163, 167, 184, 187

Gold, native, from Persia, analysis of...............................Bull 60, p 137

Gold, solubility of...Mon XIII, pp 433, 474

Gold and silver conversion tables..Bull 2

Gold and silver determinations in rocks of the Leadville region......Mon XII, p 594

Gold and silver, discovery of, in Colorado...............................Mon XII, 7-10

Gold and silver in the United States, production of, since 1804........MR 1888, p 38

Gold and silver in the United States since 1792, product of........MR 1891, pp 74-75

Gold and silver of the Comstock lode, Nevada......Mon III, pp 6-7, 9, 18, 224-225, 268

Gold and silver, statistics of.....Ann 1, p 73; Ann 2, pp 331-401; MR 1882, pp 172-185; MR 1883-84, pp 312-321; MR 1885, pp 200-207; MR 1886, pp 104-108; MR 1887, pp 58-65; MR 1888, 36-42; MR 1889-90, pp 48-55; MR 1891, pp 74-80

Gold and silver, the world's production of..............MR 1883-84, pp 319-321; MR 1888, p 40; MR 1889-90, pp 52-55

Gooch (F. A.), a method for the separation and estimation of boric acid, with an account of a convenient form of apparatus for quantitative distillations...Bull 42, pp 64-72

Gooch (F. A.), a method for the separation of sodium and potassium from lithium by the action of amyl alcohol on the chlorides, with some reference to a similar separation of the same from magnesium and calcium..Bull 42, pp 73-88

Gooch (F. A.), filtration by means of easily soluble and easily volatile filters...Bull 27, pp 27-29

Gooch (F. A.), separation of titanium and aluminum, and of titanium and iron...Bull 27, pp 16-26

Gooch (F. A.) and Whitfield (J. E.), analyses of waters of the Yellowstone national park, with an account of the methods of analysis employed...Bull 47

Göppert (Heinrich Robert), biographical sketch of..............Ann 5, pp 373-374

Gore (J. H.), administrative report for 1881-82......................Ann 3, pp 30-32

Gossan and mundic ores of Virginia, analyses of.......................MR 1891, p 24

Gould (E. R. L.), mining law of states east of the Mississippi....MR 1886, pp 722-790

Gradient, barometric................................Ann 2, pp 412-420, 536-540

Grand canyon group of rocks in Arizona, literature of the........Bull 86, pp 327-332

Grand canyon sections.......................................Ann 10, I, p 551; Bull 30, pp 42-43; Bull 81, pp 356, 357; Mon XX, p 207

Grand canyon district, brief description of the.......................Ann 1, pp 28-31

Grand canyon district, physical geology of the......................Ann 2, pp 47-166

Grand canyon district, Tertiary history of the............Ann 2, pp xii-xvi; Mon II

Grand canyon district. See, also, Arizona; Utah.

Grand gulf formation of Mississippi, Louisiana, and Texas...............Ann 12, I, pp 408-410; Bull 84, pp 161-165, 167-170, 172-175

Grand gulf group, physical history of the.......................Bull 84, pp 187-189

Granite, alteration of, to biotite-quartz schist.........................Ann 10, I, p 355

Granite and allied rocks, statistics of............MR 1882, p 455; MR 1883-84, p 663; MR 1885, p 397; MR 1886, pp 537-538; MR 1887, pp 512-515; MR 1888, pp 536-544; MR 1889-90, pp 373-440; MR 1891, pp 456-460

Granite from Bradford and Worcester, Massachusetts, analyses of..MR 1889-90, p 401

Granite from northern Wisconsin described .... Ann 10, I, pp 354–358

Granite from Steamboat springs, Nevada, described .... Mon XIII, pp 141–143

Granite from the Coast ranges of California described .... Mon XIII, p 144

Granite from the Marquette region, Michigan, described .... Bull 62, pp 147–148

Granite from the Mosquito range, Colorado, described .... Mon XII, pp 46–48

Granite from the Washoe district, Nevada, described .... Mon III, pp 34, 91–92, 190

Granite of California, origin of the .... Mon XIII, pp 174–175

Granite of Little Cottonwood canyon, Utah, age of the .... Mon XII, pp 309–313

Granite of Sierra nevada older than all sedimentary .... Mon XIII, pp 164–175

Granite of the Eureka district, Nevada .... Mon XX, pp 218–220, 337–338

Granitell of the Keweenaw series, description of the .... Mon V, pp 112–124

Granite-porphyry of the Eureka district, Nevada .... Mon XX, pp 221–229, 339–345

Granites of the Penokee iron-bearing series .... Mon XIX, pp 106, 111

Granophyre groups, relation of, to spherulites .... Ann 7, pp 274–276

Graphite, analyses of .... MR 1882, p 593

Graphite, foreign sources of .... MR 1886, pp 688–689

Graphite, statistics of .... MR 1882, pp 590–594;
MR 1883–84, pp 915–919; MR 1885, p 533; MR 1886, pp 686–689; MR 1887,
pp 672–673; MR 1888, pp 152, 361; MR 1889–90; p 507; MR 1891, pp 589–590

Gravity, specific, of lampblack .... Bull 42, pp 132–135

Great basin, climatic changes in the .... Ann 4, pp 456–457

Great basin, description of the .... Ann 3, pp 196–202;
Mon I, pp 5–12; Mon XI, pp 7–15.

Great basin, map of the northwestern part of the .... Ann 4, pp 438–439

Great basin, map showing limits of the .... Ann 3, pp 16–17

Great basin, Paleozoic rocks of the .... Mon XX, pp 185–209

Great basin, Quaternary and recent Mollusca of the .... Bull 11, pp 13–66

Great basin, Quaternary lakes of the, sketch of the .... Bull 11, pp 9–12

Great basin, structure of the mountain ranges of the .... Mon XX, pp 10, 211

Great basin. See, also, California; Nevada; Oregon; Utah.

Great Britain, Cambrian rocks of .... Bull 81, pp 373–374, 377

Great Britain; lower Cambrian strata and fauna of Wales .... Ann 10, I, p 580

Great Britain, coal area and output of, compared with those of other countries .... MR 1882, p 5; MR 1883–84, p 13; MR 1885, p 11;
MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73

Great Britain, copper production of .... MR 1882, pp 245–252;
MR 1883–84, pp 356–363; MR 1885, pp 228, 230–234; MR 1886, pp 128, 129–132;
MR 1887, pp 87, 88–92; MR 1888, pp 73, 74–77; MR 1889–90, p 73; MR 1891, p 100

Great Britain, fossil plants of, literature of the .... Ann 8, II, pp 672–689

Great Britain; iodine production of Scotland .... MR 1883–84,
pp 854–855; MR 1885, pp 489–490

Great Britain, iron and steel production of, compared with that of other countries .... MR 1882, p 109;
MR 1883–84, p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18;
MR 1888, pp 28, 29, 30, 31; MR 1889–90, pp 11, 18, 22, 35; MR 1891, pp 58, 59, 73

Great Britain, lead production of .... MR 1882, p 321;
MR 1883–84, pp 434, 435; MR 1885, pp 264, 268–269

Great Britain, mining law of .... MR 1883–84, pp 996–997, 1002

Great Britain, manganese production of .... MR 1886, pp 199–200;
MR 1887, pp 154–159; MR 1888, p 140; MR 1889–90, p 130; MR 1891, pp 143–145

Great Britain, nickel production of .... MR 1882, p 410; MR 1883–84, p 539

Great Britain; paraffin oil of Scotland .... MR 1886, pp 484–486

Great Britain, phosphate deposits of .... Bull 46, pp 80–102

Great Britain, phosphorus production of .... MR 1886, pp 676–677

Great Britain, salt production of .... MR 1883–84, p 848

Great Britain, tin production and industry of........................MR 1883-84, pp 615-617; MR 1885, pp 376, 377
Great Britain, zinc production of........MR 1882, p 358; MR 1883-84, pp 480, 486-488; MR 1885, pp 277, 281-282; MR 1886, p 159; MR 1887, p 117; MR 1888, pp 95, 96; MR 1889-90, p 92; MR 1891, pp 113-114
Great salt lake, analysis of the water of........................Mon I, pp 253, 254, 255
Great salt lake, saline deposits of ....Mon XI, pp 185-186
Great salt lake, surveys, oscillations, fauna, etc., of ....Mon I, pp 230-259
Great salt lake basin, fresh waters in, analyses of.......................Mon I, p 207
Great salt lake basin, hydrography of.........................Ann 11, II, pp 66-77, 109
Greece, fossil plants of, literature of the ....Ann 8, II, pp 716-717
Greece, lead production of ....MR 1883-84, p 434; MR 1885, pp 264, 270
Greece, manganese production of..................MR 1886, p 203; MR 1889-90, p 130
Greece, mining law of...MR 1883-84, p 999
Greece, zinc production of ....MR 1882, p 358; MR 1885, p 283
Green mountains, literature of the geology of the ....Bull 86, 355-356, 360, 371
Green mountains of Vermont, structure of the.............Ann 10, I, pp 13-14, 114-115
Green river group, correlation of the..................Bull 83, pp 119, 123, 140, 145-146
Greenland, cryolite production of ....MR 1882, p 608; MR 1883-84, p 954; MR 1886, p 692; MR 1887, p 659; MR 1889-90, p 473
Greenland, fossil plants of, literature of the ....Ann 8, II, pp 830-834
Greenstone conglomerates of the Penokee iron-bearing series....Mon XIX, pp 374-387
Greenstone, lower Quinnesec, analyses of............................Bull 62, pp 89-91
Greenstone-schist areas of the Menominee and Marquette regions of Michigan, a contribution to the subject of dynamic metamorphism in eruptive rocks...Bull 62
Greenstone schist, relation to diabase agglomerate, Marquette region, Michigan..Bull 62, pp 185-191
Greenstone schists, banded, described.........................Bull 62, pp 154-162, 184
Greenstones, aphanitic, described.........................Bull 62, pp 163-168, 171-173
Grenville series of rocks of Canada..............................Bull 86, 27-35
Greylock, mount, succession and correlation of the lithological horizons in ..Bull 86, pp 375-376
Greywackes of the lake Superior region..........................Ann 10, I, pp 426-431
Grindstones, statistics of..................MR 1882, p 479; MR 1883-84, pp 713-714; MR 1885, pp 428-429; MR 1886, pp 582-585; MR 1887, pp 552-553; MR 1888, pp 576-577; MR 1889-90, p 458; MR 1891, pp 552-553
Gros ventre and Wyoming ranges, Archean and Algonkian rocks of ....Bull 86, p 280
Guanos, analyses of..................................Bull 46, pp 119-122, 125, 126
Guanos, deposits and statistics of.................................Bull 46, pp 117-125
Guitermanite from San Juan county, California, description of...Bull 20, pp 105-107
Guts, the, of Mississippi.......................................Ann 12, I, pp 434-436
Guyard (A.), metallurgy of the Leadville, Colorado, region.........Ann 2, pp 285-290; Mon XII, pp 609-751
Gymnosperms, fossil fruits of, from the Potomac or younger Mesozoic.......Mon XV, pp 262-273
Gymnosperms from the Carboniferous basins of southwestern Missouri......Bull 98, pp 105-109
Gymnosperms. See, also, Coniferæ; Cycadeæ; Zamieæ.
Gypsum, analyses of...MR 1887, pp 598-600
Gypsum deposits in Kansas ....Bull 57, pp 22-24, 48
Gypsum or land plaster in Ohio..................................MR 1887, pp 596-600
Gypsum playa and dunes in the Bonneville basin ....Mon I, p 223
Gypsum, statistics of..................MR 1882, pp 526-531; MR 1883-84, pp 809-815; MR 1885, pp 458-464; MR 1886, pp 620-623; MR 1887, pp 595-603; MR 1888, pp 6, 8, 10, 11; MR 1889-90, pp 465-467; MR 1891, pp 580-583

Gypsum plains district, N. M., irrigation possibilities in the ....Ann 12, II, pp 281–282
Gyrolite, a new occurrence of..............................Bull 64, pp 22–23
Habitus, value of, in rock determinations..............................Mon III, p 85
Hade, fault, strike, etc., defined ....Ann 4, p 442
Hague (A.), administrative report for 1879–80..............................Ann 1, pp 32–35
Hague (A.), administrative report for 1880–81..............................Ann 2, pp 21–35
Hague (A.), administrative report for 1881–82..............................Ann 3, pp 10–14
Hague (A.), administrative report for 1882–83..............................Ann 4, pp 16–18
Hague (A.), administrative report for 1883–84..............................Ann 5, pp 15–19
Hague (A.), administrative report for 1884–85..............................Ann 6, pp 54–59
Hague (A.), administrative report for 1885–86..............................Ann 7, pp 87–91
Hague (A.), administrative report for 1886–87..............................Ann 8, I, pp 149–153
Hague (A.), administrative report for 1887–88..............................Ann 9, pp 91–96
Hague (A.), administrative report for 1888–89..............................Ann 10, I, pp 132–137
Hague (A.), administrative report for 1889–90..............................Ann 11, I, pp 83–87
Hague (A.), administrative report for 1890–91..............................Ann 12, I, pp 92–96
Hague (A.), geology of Eureka district, Nev ...Ann 3, pp 237–290; Mon xx and atlas
Hague (A.), quoted on the glaciers of mount Hood..............................Ann 5, pp 339–340
Hague (A.) and Iddings (J. P.), development of crystallization in the igneous rocks of Washoe, Nevada, with notes on the geology of the district....Bull 17
Hahn (O. H.), the smelting of argentiferous lead in the West...MR 1882, pp 324–345
Hallock (W.), chemical action between solids ....Bull 64, pp 34–37
Hallock (W.), new method of making alloys..............................Bull 60, pp 147–148
Hallock (W.), preliminary note on the coefficients of thermal expansion of certain rocks ....Bull 78, pp 109–118
Hallock (W.), specific gravity of lampblack..............................Bull 42, pp 132–135
Hallock (W.), the flow of solids, or the behavior of solids under high pressure..............................Bull 55, pp 67–75; Bull 64, pp 38–39
Halloysite from California, analysis of..............................Bull 9, p 12
Hamburg limestone and shale at Eureka, Nevada.............................. Mon XX, pp 39–41
Hampson (T.), death and biographic sketch of..............................Ann 9, pp 44–46
Hampson (T.), rules for the preparation of manuscript....See p 323 of this bulletin
Harris (G. D.) and Dall (W. H.), Neocene of North America, a correlation essay.............................. Bull 84
Hassayampa disaster in Arizona, causes of ....Ann 11, II, pp 228–229
Hastings series of rocks of Canada ....Bull 86, pp 27–35
Hawaiian islands, climate and vegetation of the ....Ann 4, pp 88–90
Hawaiian islands, coral rocks and a soil from, analyses of..............................Bull 60, p 164
Hawaiian islands, general map of the ....Ann 4, pp 80–81
Hawaiian islands, geography of the..............................Ann 4, pp 81–91
Hawaiian race, growth of the, to full civilization ....Ann 4, pp 148–149
Hawaiian volcanoes..............................Ann 4, pp 75–219
Hawthorne beds of Florida..............................Bull 84, pp 107–111
Hay (R.), a geological reconnaissance in southwestern Kansas..............................Bull 57
Hayden (F. V.), administrative report for 1879–80..............................Ann 1, p 50
Hayden (F. V.), administrative report for 1880–81..............................Ann 2, pp 42–44
Hayden (F. V.), administrative report for 1883–84..............................Ann 5, pp 28–30
Hayden (F. V.), administrative report for 1884–85..............................Ann 6, pp 48–53
Hayden (F. V.), administrative report for 1885–86..............................Ann 7, pp 85–87
Hayden (F. V.), death and biographic sketch of..............................Ann 9, pp 31–38
Hayes (C. W.) accompanies Schwatka to the Yukon valley .... Ann 12, I, p 62
Health as affected by soils..............................Ann 12, I, pp 340–344
Heat, conduction of, within the earth, theory and solution of the problem of the ....Ann 4, pp 190–191
Heat conductivity of steel..............................Bull 14, pp 25–27

Heat, effect of, on solubility of sulphate of lime .... Ann 7, pp 502–503
Heat expansion, literature of .... Bull 92, pp 17–18
Heat of lava, etc., source of the .... Mon XIII, p 411
Heat of the Comstock lode, Nevada .... Ann 2, pp 310–314; Mon III, pp 228–265, 387–392; Mon IV, pp 389–400
Heat. See, also, Temperature; Thermal.
Heer (Oswald), biographical sketch of .... Ann 5, pp 378–379
Heights between lake Superior and the Rocky mountains .... Bull 72
Heights in the Bonneville basin .... Mon I, pp 405–419
Heights in the Dominion of Canada .... Bull 6
Heights in the United States, dictionary of .... Bull 5; Bull 76
Heights, a new method of measuring, with the barometer .... Ann 2, pp xxxviii–xl, 403–566
Heilprin (A.), North American Tertiary Ostreidæ .... Ann 4, pp 309–316
Henry mountain rocks, notes on the .... Mon XII, pp 359–362
Hesperornis, description and restoration of .... Ann 3, pp 52–69
Hickman group of rocks of Kentucky .... Bull 83, pp 71–72
Hidden (W. E.), hiddenite, the new emerald-green gem .... MR 1882, pp 502–503
Hidden (W. E.), the discovery of emeralds in North Carolina ... MR 1882, pp 500–502
Highlands of New Jersey and New York, literature of the geology of the ... Bull 86, pp 386, 387, 390, 391, 392, 396, 399, 400, 401, 402, 413, 414, 415
Hilgard (E. W.), the asphaltum deposits of California .... MR 1883–84, pp 938–948
Hilgard (E. W.), the salines of Louisiana .... MR 1882, pp 554–565
Hill (R. T.), clay materials of the United States .... MR 1891, pp 474–528
Hill (R. T.), present condition of knowledge of the geology of Texas .... Bull 45
Hill (R. T.), the coal fields of Texas .... MR 1891, pp 326–328
Hillebrand (W. F.), analyses of three descloizites from new localities .... Bull 64, pp 24–28
Hillebrand (W. F.), associated rare minerals from Utah .... Bull 20, pp 83–88
Hillebrand (W. F.), chemistry of the rocks and ores of Leadville, Colorado .... Mon XII, pp 585–608
Hillebrand (W. F.), descloizite (?) from Beaverhead county, Montana .... Bull 60, pp 130–131
Hillebrand (W. F.), mineralogical notes .... Bull 55, pp 48–55
Hillebrand (W. F.), miscellaneous mineral notes .... Bull 20, pp 89–99
Hillebrand (W. F.), new analyses of uraninite .... Bull 90, pp 22–25
Hillebrand (W. F.), new mineral species from Colorado .... Bull 20, pp 100–109
Hillebrand (W. F.), the occurrence of nitrogen in uraninite, and the composition of uraninite in general .... Bull 78, pp 43–79
Hillebrand (W. F.), uraninites, North American, preliminary remarks on .... Bull 60, pp 131–133
Hillebrand (W. F.) and Cross (W.), contributions to the mineralogy of the Rocky mountains .... Bull 20
Hillebrand (W. F.) and Cross (W.), minerals from the basalt of Table mountain, Golden, Colorado .... Bull 20, pp 13–39
Hillebrand (W. F.) and Cross (W.), minerals from the neighborhood of Pike's peak .... Bull 20, pp 40–73
Hillebrand (W. F.) and Melville (W. H.), on the isomorphism and composition of thorium and uranous sulphates .... Bull 90, pp 26–33
Hillebrand (W. F.) and Washington (H. S.), notes on certain rare copper minerals from Utah .... Bull 55, pp 38–47
Hoffman (H. O.), recent improvements in desilverizing lead in the United States .... MR 1883–84, pp 462–473
Holden (E. S.), earthquakes in California in 1890 and 1891 .... Bull 95
Holmes (W. H.), administrative report for 1884–85 .... Ann 6, pp 94–97
Holmes (W. H.), administrative report for 1885–86 .... Ann 7, pp 136–137

Holmes (W. H.), administrative report for 1886–87 .... Ann 8, I, pp 202–203

Holmes (W. H.), administrative report for 1887–88 .... Ann 9, pp 143–144

Holmes (W. H.), administrative report for 1888–89 .... Ann 10, I, pp 189–190

Holmes (W. H.), quoted on glaciers in the Rocky mountains ...... Ann 5, pp 344–347

Honduras, fossil plants of, literature of the .... Ann 8, II, p 824

Hoosac mountain, literature of the geology of .... Bull 86, pp 361, 363, 371–373

Hope valley, California, irrigation surveys in .... Ann 11, II, pp 180–181

Hornblende a product of mineralogical metamorphism .... Bull 62, p 210

Hornblende, brown, from Pierrepont, New York, analysis of .... Bull 78, p 119

Hornblende, progress of alteration of, during metamorphism of massive rocks .. Bull 62, p 216

Hornblende rocks, gabbros and associated, near Baltimore, Maryland .... Bull 28

Hornblende, speculation on the "black border" of, in igneous rocks ...... Mon III, pp 59–61

Hornblende-andesite from Hague volcano, Boguslof island, Bering sea, Alaska, analysis of .... Bull 27, pp 63–64

Hornblende-andesite in Washoe district, Nevada, description and occurrence of .... Mon III, pp 53–62, 66–70, 116–125, 130–134, 199–201, 203–205

Hornblende-andesite of Eureka district, Nevada .... Mon XX, p 233

Hornblende-andesite of Washoe district, Nevada, its relation to diorite .... Bull 17, pp 23–26

Hornblende-andesite, relation of, to pyroxene-andesite .... Bull 17, p 34

Hornblende-gneiss, probable derivation of, from eruptive rocks .. Ann 10, I, pp 360–362

Hornblende-mica-andesite of Eureka district, Nevada .... Mon XX, pp 364–368

Hornblende and pyroxene, intergrowth of, in glassy rocks ..... Ann 12, I, pp 610–617

Hornblende and quartz, alteration products of feldspar .... Mon XIX, p 110

Hot-spring waters, analyses of .... Bull 9, pp 24, 27, 28, 30–35; Bull 42, p 148; Bull 60, p 174

Hot-spring waters of Yellowstone national park, character of the .. Ann 9, pp 638–640

Hot springs, association of, with cinnabar .... Mon XIII, p 403

Hot springs in Colusa county, California .... Mon XIII, p 367

Hot springs in the Lahontan basin .... Mon XI, pp 48, 49, 51–54, 60

Hot springs of Fumarole butte, Utah .... Mon I, p 333

Hot springs of Mono lake, California .... Ann 8, I, pp 278, 288

Hot springs of Sulphur bank, California, origin and age of the .... Mon XIII, p 254

Hot springs of the Yellowstone national park .... Ann 9, p 628

Hot springs, travertine and siliceous sinter of .... Ann 9, pp 613–676

Hot water, deposits from .... Mon XIII, pp 260–261

Hot waters of Comstock lode, Nevada .... Ann 2, p 313; Mon III, pp 286–287

Hot waters, vegetation of .... Ann 9, pp 620–628, 657

Howe (H. M.), copper smelting .... Bull 26

Hübnerite from Ouray county, Colorado .... Bull 20, p 96

Hudson bay, pre-Cambrian rocks of the region about .... Bull 86, pp 209, 500

Huerfano beds, correlation of the .... Bull 83, pp 142–146

Human remains in the auriferous gravels of California .... Bull 84, pp 221–222

Humboldt and other mountains of Nevada, literature of the geology of the ..... Bull 86, pp 299–308

Humboldt group of rocks of Utah and Nevada .... Bull 84, pp 312–313, 315–316

Humboldt lake and river, Nevada, analyses of the water of .... Mon XI, pp 41, 67

Humidity as a disturbing factor in barometric hypsometry .... Ann 2, pp 425–427

Humidity, is it increased by irrigation? .... Ann 12, II, p 234

Hunt (T. S.), system of classification for the pre-Paleozoic groups .. Ann 7, pp 381–389; Bull 86, pp 462–466

Huntley (D. B.), list of ores, minerals, and mineral substances of industrial importance in Arizona and Utah .... MR 1882, pp 760–764, 773–775

Huntley (D. B.), mining districts of Arizona....................MR 1882, pp 765–766
Huronian areas, investigations in ....Ann 5, pp 187–208
Huronian defined ....Bull 86, p 463
Huronian of the northwestern states, metamorphism in the........Ann 5, pp 241–242
Huronian quartzites, genesis of and metamorphism in ....Bull 8, pp 48–52
Huronian rocks, enlargements in ....Bull 8, pp 23–37
Huronian rocks of the lake Superior region.............................Mon v,
pp 386–394, 402–409; Mon xix, pp 31–40, 42–59, 61–66, 75–77
Huronian system, history of the term..........................Bull 86, pp 470–474
Huronian, the original.................................Bull 86, pp 23–50, 498–499
Huronian and Laurentian, relations of the Keweenawan rocks to the ....Ann 3,
pp 156–173
Huronian and Laurentian, relations of the Penokee iron-bearing series of
Michigan and Wisconsin to the.........................Ann 10, I, pp 458–464
Huronian. See, also, Algonkian.
Hyatt (A.), administrative report for 1889–90....................Ann 11, I, pp 97–100
Hyatt (A.), administrative report for 1890–91 ....Ann 12, I, pp 111–112
Hydrography of the arid regions of the United States.................Ann 10, II,
pp 36, 78–90; Ann 11, II, pp 1–110; Ann 12, II, pp 213–361
Hydrography the basis for a classification of topographic forms...Ann 7, pp 558–564
Hydrography. See, also, Drainage.
Hydronephelite from Litchfield, Maine, description of..............Bull 42, pp 31–34
Hydrozoa, description of species of, from the middle Cambrian of North
America...Bull 30, pp 91–94
Hydrozoa of the Olenellus zone.................................Ann 10, I, pp 604–606
Hypersthene, analyses of...Bull 1, p 29
Hypersthene in basalt...Mon XIII, p 157
Hypersthene in dacite..Mon xx, p 369
Hypersthene in pyroxene-andesite......................................Mon xx, p 356
Hypersthene in rhyolitic pumice ....Mon xx, p 381
Hypersthene, methods of isolation of ....Bull 1, p 27
Hypersthene-andesite and triclinic pyroxene in augitic rocks ....Bull 1, pp 19–38
Hypersthene-andesite from Buffalo peaks, Colorado ....Mon XII, p 354
Hypersthene-andesite from San Francisco mountains, analysis of......Bull 42, p 139
Hypersthene-gabbro in Delaware, description of....................Bull 59, pp 10–15
Hypersthene-gabbro near Baltimore, Maryland, description of......Bull 28, pp 18–26
Hypozoic. See Archean.
Hypsometry, barometric, a new method of.............Ann 2, pp xxxviii–xl, 403–566
Ice age. See Glacial; Pleistocene.
Ice-dam, Pleistocene, of the Ohio............................Bull 58, pp 17–38, 76–101
Ice invasions, the great, rock-scorings of.........................Ann 7, pp 147–248
Iceland, fossil plants of, literature of the ....Ann 8, II, p 830
Iceland, quicksilver deposits in.....................................Mon XIII, pp 24–26
Ichthyornis, description and restoration of............................Ann 3, pp 69–83
Idaho, altitudes in ....Bull 5, pp 84–86; Bull 72, p 225; Bull 76
Idaho, boundary lines of, and formation of territory...............Bull 13, pp 32, 127
Idaho, Cambrian rocks of, correlation of the............Bull 81, pp 161, 162, 320–323
Idaho, coal area and statistics of..............MR 1882, p 49; MR 1883–84, pp 12, 39;
MR 1885, pp 11, 26; MR 1886, pp 225, 230, 252; MR 1887, pp
169, 223; MR 1888, pp 169, 171, 241; MR 1889–90, pp 147, 185
Idaho, copper from, statistics of ....Ann 2, p xxix; MR 1882, p 229;
MR 1883–84, pp 329, 342; MR 1885, p 210; MR 1886, p 112; MR
1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84
Idaho, geologic investigations in..Ann 7, p 78
Idaho, geologic maps of, listed ....Bull 7, p 170
Idaho, glacial investigations in.................................Ann 7, pp 178–179, 180

Idaho, gold and silver from, statistics of........Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 76, 77

Idaho; irrigation problems along the Bear and Snake rivers....Ann 11, II, pp 238–239

Idaho; irrigation; Snake river drainage........Ann 12, II, p 344

Idaho, irrigation surveys, engineering, hydrography, segregations, etc., in.......Ann 10, II, pp viii, 58, 88–89, 106–108; Ann 11, II, pp 79–86, 102, 105, 106, 110

Idaho; latitude and longitude of Boise, determined..........Ann 11, I, p 129; Bull 70

Idaho, lead from, statistics of........MR 1882, p 311; MR 1883–84, pp 416, 424, 425; MR 1885, pp 248, 258; MR 1886, p 146; MR 1887, pp 107–108; MR 1888, p 88; MR 1889–90, p 80

Idaho, mineral springs of........Bull 32, pp 181–182; MR 1891, p 604

Idaho, minerals of, the useful ....MR 1882, pp 770–771; MR 1887, pp 722–724

Idaho, Neocene beds of........Bull 84, pp 285–287

Idaho; Snake river; reservoirs and canal lines surveyed for irrigation purposes ....Ann 11, II, pp 190–200

Idaho, tin ore in ....MR 1883–84, p 613

Idaho, topographic work in ....Ann 11, II, pp 303–304, 309; Ann 12, I, p 47

Iddings (J. P.), a group of volcanic rocks from the Tewan mountains, New Mexico, and the occurrence of primary quartz in certain basalts.......Bull 66

Iddings (J. P.), microscopical petrography of the eruptive rocks of the Eureka district, Nevada ....Mon XX, pp 335–406

Iddings (J. P.), Obsidian cliff, Yellowstone national park...........Ann 7, pp 249–295

Iddings (J. P.), the eruptive rocks of Electric peak and Sepulchre mountain, Yellowstone national park ....Ann 12, I, pp 569–664

Iddings (J. P.) and Hague (A.), development of crystallization in the igneous rocks of Washoe, Nevada, with notes on the geology of the district...Bull 17

Igneous rocks, assimilation of sedimentary masses by, discussion of the....Mon XII, pp 308–313

Igneous rocks, associated, of the Newark system ....Bull 85, pp 66–77

Igneous rocks, classification of, discussion of the ....Mon XII, pp 319–321

Igneous rocks, classification of, facts bearing on the, derived from the study of the rocks of Electric peak and Sepulchre mountain, Yellowstone national park........Ann 12, I, pp 660–663

Igneous rocks; comparison of Tertiary and Keweenawan eruptives.....Mon V, p 436

Igneous rocks, crystallization in the, of Washoe, Nevada, development of...Bull 17

Igneous rocks, crystallization of, physical conditions in relation to..Bull 66, pp 23–29

Igneous rocks; crystallization, unusual course of, in granitic magma..Ann 10, I, p 357

Igneous rocks, decomposition of constituents of, by weathering..Bull 62, pp 213–214

Igneous rocks, decomposition of, in the Mosquito range, Colorado.....Mon XII, p 356

Igneous rocks, decomposition of, in the Washoe district, character of the ..Mon III, pp 72–80, 209–218, 369–372

Igneous rocks; fluid inclusions, secondary origin of..........Mon III, pp 79, 119, 371

Igneous rocks; intrusive masses, contact metamorphism not marked about.....Mon XII, p 307

Igneous rocks; intrusive masses, distribution of, in the Rocky mts...Mon XII, p 305

Igneous rocks; intrusive masses; force of intrusion discussed....Mon XII, p 298–300

Igneous rocks; intrusive masses of the Mosquito range and Leadville district, Colorado........Ann 2, p 226; Mon XII, pp 295–306

Igneous rocks; intrusive masses; traps of New Jersey........Bull 67

Igneous rocks; intrusive masses. See, also, Laccolites.

Igneous rocks; magmas considered as solutions........Bull 66, pp 26–29

Igneous rocks, metamorphism of, general discussion of the..........Bull 62, pp 34–63

Igneous rocks, mineral composition, gradations in, betweeen members of a group of........Bull 66, pp 17–19

Igneous rocks, nomenclature of; name asperite proposed........Mon XIII, pp 151, 459
Igneous rocks of the Henry mountains, correspondence of the, to rocks of Colorado..Mon XII, pp 305–306, 359–363
Igneous rocks of the lake Superior district.........................Bull 86, pp 173–174
Igneous rocks, origin of..Mon XX, pp 267–289
Igneous rocks; origin of massive rocks of California...........Mon XIII, pp 164–175
Igneous rocks, petrographical description of, from near Baltimore, Maryland..Bull 28
Igneous rocks, petrographical description of, from Coast ranges of California..Mon XIII, pp 140–164
Igneous rocks, petrographical description of, from Delaware.................Bull 59
Igneous rocks, petrographical description of, from Eureka district, Nevada.....Ann 3, pp 273-280; Mon XX, pp 218, 335–394
Igneous rocks, petrographical description of, from Henry mts...Mon XII, pp 359-363
Igneous rocks, petrographical description of, from Keweenaw series...........Ann 3, pp 101-115; Mon V, pp 34–133
Igneous rocks, petrographical description of, from Leadville district, Colorado...Ann 2, pp 221–224
Igneous rocks, petrographical description of, from Menominee and Marquette regions of Michigan..Bull 62
Igneous rocks, petrographical description of, from Mosquito range, Colorado...Mon XII, pp 74–89, 319–362
Igneous rocks, petrographical description of, from Washoe district, Nevada...Ann 2, pp 297–300
Igneous rocks; relations between gabbro and diorite in Baltimore region......Bull 28, pp 34–49
Igneous rocks; relations of gneiss to granite, in northern Wisconsin ....Ann 10, I, pp 362-364
Igneous rocks; relations of the igneous rocks of Washoe, Nevada............Bull 17
Igneous rocks; relations of the traps of the Newark system, New Jersey.....Bull 67
Igneous rocks, relations of, to ore-deposits...............................Mon III, p 32
Igneous rocks, review of work of Geological Survey upon the....Ann 10, I, pp 45–49
Igneous rocks, soils derived from..............................Ann 12, I, pp 239–245
Igneous rocks, succession of, in the Coast ranges of California...Mon XIII, pp 221–225
Igneous rocks, succession of, in the Eureka district, Nev..Ann 3, pp 273–276, 281–285
Igneous rocks, succession of, in the Keweenaw series.............Mon V, pp 432–436
Igneous rocks, succession of, in the Washoe district, Nev..Mon III, pp 188–208, 380–338
Igneous rocks, succession of, means of determining the.................Mon III, p 188
Igneous rocks; structural features of the Keweenaw series..................Ann 3, pp 116–131; Mon V, pp 134–151
Igneous rocks, structures of, amygdaloidal.........................Mon V, pp 134–139
Igneous rocks, structures of, columnar, in basalt of volcanic necks..Ann 6, pp 172–174
Igneous rocks, structures of, columnar, in obsidian.......................Ann 7, p 257
Igneous rocks, structures of, defined....................................Bull 17, pp 14–15
Igneous rocks, structures of, discussion on the...........Mon XII, pp 302–304, 319–321
Igneous rocks, structures of, distinct from those of clastic rocks.......Bull 62, p 196
Igneous rocks, structures of, granitoid and porphyritic..........Mon XIII, pp 162–164
Igneous rocks, structures of, importance of understanding the.........Bull 62, p 196
Igneous rocks, structures of; lamination of acid lavas, cause of....Ann 7, pp 260, 286
Igneous rocks, structures of; lithophysæ, origin of.................Ann 7, pp 279–290
Igneous rocks, structures of; micropegmatite (granophyre) in relation to spherulites ....Ann 7, pp 274–276
Igneous rocks, structures of, poicilitic.......................Bull 62, pp 78, 79, 183, 196
Igneous rocks, structures of; spherulites, character and origin of.............Ann 7, pp 262–264, 276–278
Igneous rocks, structures of, transitions in the.................................Bull 17

Igneous rocks; traps in the Triassic formation of the Connecticut valley.....Ann 7, pp 462-468

Igneous rocks. See, also, Eruptive rocks; Lava; Rocks.

Iles (M. W.), lead slags.....MR 1883-84, pp 440-462

Illinois, altitudes in.....Bull 5, pp 87-94; Bull 72, p 205; Bull 76

Illinois; artesian wells at Rockford.....Ann 11, II, p 262

Illinois, boundary lines of, and formation of from territory northwest of Ohio river.....Bull 13, pp 28, 29, 113

Illinois, building stone from, statistics of.....MR 1882, p 451; MR 1886, pp 540, 542; MR 1887, p 515; MR 1888, p 540; MR 1889-90, pp 374, 388-390; MR 1891, pp 461, 462, 464, 465

Illinois, clay, brick, and pottery industry in.....MR 1882, pp 467, 471; MR 1883-84, p 700; MR 1886, p 568; MR 1887, pp 535, 537, 546; MR 1888, pp 558-559, 566; MR 1891, p 510

Illinois; clays from Henry county, analyses of.....Bull 27, pp 66-67

Illinois, coal area and statistics of.....Ann 2, p xxviii; MR 1882, pp 49-51; MR 1883-84, pp 12, 39-43; MR 1885, pp 11, 27-28; MR 1886, pp 225, 230, 253-261; MR 1887, pp 169, 171, 224-237; MR 1888, pp 169, 171, 242-256; MR 1889-90, pp 195-205; MR 1891, pp 179, 219-226

Illinois, coke in, manufacture of.....MR 1883-84, pp 160-163; MR 1885, pp 80, 89-90; MR 1886, pp 378, 384, 394-395; MR 1887, pp 383, 389, 398; MR 1888, pp 395, 400, 408-409; MR 1891, pp 360, 361, 378-379

Illinois, fossils from.....Ann 8, II, pp 892-893; Mon XVI, pp 62, 63, 185, 187, 191, 193, 198, 203, 208, 211, 213, 215, 218, 226; Bull 22, pp 23, 24, 25, 26, 29

Illinois; fulgurite from Whiteside county, analysis of.....Bull 42, p 140

Illinois, geologic and paleontologic investigations in.....Ann 5, pp 21, 23; Ann 6, p 35; Ann 7, p 84; Ann 8, I, p 142; Ann 10, I, p 129; Ann 11, I, p 75; Ann 12, I, p 88

Illinois, geologic maps of, listed.....Bull 7, pp 89, 90, 91, 94

Illinois, glacial investigations in.....Ann 3, pp 322-323, 331; Ann 7, p 157

Illinois, iron and steel from, statistics of.....MR 1882, pp 120, 125, 129, 130, 133, 134, 135, 136, 137; MR 1883-84, p 252; MR 1885, pp 182, 184, 186; MR 1886, p 18; MR 1887, p 11; MR 1888, pp 14, 23, 25; MR 1889-90, pp 10, 12, 17; MR 1891, pp 54, 55, 61

Illinois, lead from, statistics of.....Ann 2, p xxviii; MR 1882, p 312; MR 1883-84, pp 416, 426; MR 1885, p 248

Illinois, lime production of.....MR 1888, p 555

Illinois; limestone from Cook county, analysis of.....MR 1889-90, p 390

Illinois, limestone production of.....MR 1891, pp 464, 465

Illinois, mineral springs of.....Bull 32, pp 142-144; MR 1883-84, p 981; MR 1885, p 537; MR 1886, p 716; MR 1887, p 683; MR 1888, p 626; MR 1889-90, p 526; MR 1891, pp 603, 605

Illinois, minerals of, the useful.....MR 1882, pp 677-679; MR 1887, pp 725-727

Illinois, mining laws of.....MR 1886, pp 750-759

Illinois, natural gas localities and statistics of.....MR 1885, pp 167-168; MR 1886, pp 511-513; MR 1887, pp 466, 494; MR 1889-90, p 367; MR 1891, p 138

Illinois, rocks in, classification of.....Bull 80, pp 159-163

Illinois, Tertiary deposits in.....Bull 83, pp 73, 83

Illinois, topographic work in.....Ann 11, I, p 39; Ann 12, I, p 29

Illinois; the driftless area of the upper Mississippi valley.....Ann 6, pp 199-322

Illinois; the glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana, and Illinois.....Bull 58

Illinois; water from a spring at M'Leansborough, analysis of.....Bull 60, p 172

Illinois, zinc and zinc works in.....Ann 2, p xxix; MR 1882, pp 346, 347, 365-367, 378-381; MR 1883-84, p 475; MR 1885, p 273; MR 1886, pp 154, 155; MR 1887, p 113; MR 1888, p 92; MR 1889-90, p 89

Inclusion in diorite from near Peekskill, New York, analysis of........Bull 60, p 158

Incrustations from Nevada, analyses of........................Bull 27, pp 69–70

Independence lake, California, surveyed as a reservoir site..Ann 11, II, pp 174–175, 181

India, Cambrian rocks of ....Bull 81, p 378

India, coal area and output of, compared with those of other countries....MR 1882, p 5; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189

India, diamond mines of ....MR 1887, p 569

India, fossil plants of, literature of the.........................Ann 8, II, pp 793–796

India, irrigation in.........................Ann 11, II, p 276; Ann 12, II, pp 363–561

India, map of (folding) ....Ann 12, II, pocket

India, topography, geology, meteorology, and forestry of ....Ann 12, II, p 399

India rubber, vulcanized, the solution of..........................Bull 92, pp 85–94

Indian territory, altitudes in......................................Bull 5, p 104; Bull 76

Indian territory; Choctaw coal fields, description of the....MR 1889–90, pp 207–214

Indian territory, coal area and statistics of..MR 1882, pp 51–52; MR 1883–84, pp 12, 45; MR 1885, pp 11, 29; MR 1886, pp 225, 330, 265–266; MR 1887, pp 169, 171, 244–245; MR 1888, pp 169, 171, 260–261; MR 1889–90, pp 207–214; MR 1891, pp 180, 232–233

Indian territory, Coal measures of, columnar section of the......MR 1889–90, p 212

Indian territory, coke in the, manufacture of......................MR 1883–84, p 164; MR 1885, pp 80, 90–91; MR 1886, pp 378, 384, 397; MR 1887, pp 383, 389, 400; MR 1888, pp 395, 400, 409–410; MR 1891, pp 360, 366, 380

Indian territory, Cretaceous rocks of..Bull 82

Indian territory, fossils from ....Ann 8, II, p 898

Indian territory, manganese ore from, analysis of......................MR 1891, p 135

Indian territory, manganese production of..................MR 1891, pp 127, 134–135

Indian territory, mineral springs of ....Bull 32, p 123

Indian territory, minerals of, the useful..............MR 1882, p 681; MR 1887, p 730

Indian territory, Neocene beds of ....Bull 84, p 301

Indiana, altitudes in.......................................Bull 5, pp 95–103; Bull 76

Indiana, boundary lines of, and formation of ffom territory northwest of Ohio river ....Bull 13, pp 28, 29, 111, 112

Indiana, building stone from, statistics of......MR 1882, p 451; MR 1887, p 516; MR 1888, p 540; MR 1889–90, pp 374, 390–393; MR 1891, pp 461, 462, 464, 465

Indiana, clay, brick, and pottery industry of.............MR 1882, pp 467, 471; MR 1883–84, pp 696, 701; MR 1885, pp 416, 421; MR 1886, pp 568, 575; MR 1887, pp 535, 537, 547; MR 1888, pp 559, 566; MR 1891, p 510

Indiana, coal area and statistics of..................................Ann 2, p xxviii; MR 1882, pp 52–55; MR 1883–84, pp 12, 43–45; MR 1885, pp 11, 29; MR 1886, pp 225, 230, 261–265; MR 1887, pp 169, 171, 237–243; MR 1888, pp 169, 171, 256–260; MR 1889–90, pp 146, 205–207; MR 1891, pp 180, 226–232

Indiana, coke in, manufacture of ....MR 1883–84, pp 163–164; MR 1885, pp 378, 384, 395–397; MR 1887, pp 383, 389, 398–400; MR 1888, pp 395, 400, 409; MR 1891, pp 360, 366, 379

Indiana, fossils from......................................Ann 8, II, pp 891–892; Mon XVI, pp 27, 31, 37, 60, 87, 193, 200, 206, 209, 210, 217, 218, 223

Indiana, geologic and paleontologic investigations in ....Ann 5, pp 21, 23; Ann 6, p 35; Ann 8, I, p 142; Ann 9, pp 85, 86, 105; Ann 10, I, p 149; Ann 11, I, p 74; Ann 12, I, p 88

Indiana, geologic section of northern ....MR 1888, p 505

Indiana, geologic structure of.......................................Ann 11, I, pp 623–653

Indiana, geologic maps of, listed..................................Bull 7, pp 80, 82, 87, 88

Indiana, glacial investigations in......Ann 3, pp 322, 328, 330–333; Ann 7, pp 157, 207

Indiana, iron and steel from, statistics of..............MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184, 186; MR 1886, p 18; MR 1887, p 11; MR 1888, pp 14, 23; MR 1889–90, pp 10, 12, 17; MR 1891, pp 54, 55, 61

Indiana, lime production of......MR 1887, p 533; MR 1888, p 555; MR 1889–90, p 392
Indiana; limestone from Adams, Howard, and Lawrence counties, analyses of..MR 1889–90, pp 392–393
Indiana; limestone from Bedford, analysis of..........................Bull 42, p 140
Indiana, limestone production of..............................MR 1891, pp 464, 465
Indiana, mineral springs of............Bull 32, pp 134–141; MR 1883–84, p 981; MR 1885, p 537; MR 1886, p 716; MR 1887, p 683; MR 1888, p 626; MR 1889–90, p 526; MR 1891, pp 603, 605
Indiana, minerals of, the useful...........MR 1882, pp 679–681; MR 1887, pp 727–730
Indiana, mining laws of.......................................MR 1886, pp 746–750
Indiana, natural gas field of...................................Ann 11, I, pp 579–742
Indiana, natural gas localities, and statistics of...........MR 1886, pp 508–511; MR 1887, pp 466, 485–489; MR 1888, pp 485–486, 499–506; MR 1889–90, pp 367–372; MR 1891, p 438
Indiana, petroleum production of.....................MR 1891, pp 405, 407, 433–434
Indiana, rock formations of...Bull 80, p 139
Indiana, sandstone production of..............................MR 1891, pp 461, 462
Indiana; the glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana, and Illinois...Bull 58
Indiana; the Trenton limestone as a source of petroleum and inflammable gas in Ohio and Indiana.......................................Ann 8, II, pp 475–662
Indiana, whetstone quarries in ....MR 1886, pp 592–593
Indiana and Ohio, limestones from, analyses of.................Bull 60, pp 160–162
Induration of sandstones by enlargement of quartz fragments ......Bull 8, pp 13–17
Induration of sandstones by weathering.......................Bull 8, pp 12, 16, 42, 49
Infusorial earth, analyses of......MR 1882, p 479; MR 1883–84, p 721; MR 1886, p 587
Infusorial earth, statistics of............. MR 1882, pp 479–480; MR 1883–84, pp 720–721; MR 1885, p 433; MR 1886, pp 587–588; MR 1887, p 554; MR 1888, pp 578–579; MR 1889–90, p 459
Infusorial earth and bog iron ore in swamps..................Ann 10, I, pp 305–307
Inheritance by soils from rocks...............................Ann 12, I, pp 300–306
Insects, fossil, a classed and annotated bibliography of.......................Bull 69
Insects, fossil, geological distribution of ....Bull 31, pp 110–111
Insects, fossil, history and distribution of.......................Bull 31, pp 102–113
Insects, fossil, including myriapods and arachnids, systematic review of our present knowledge of ....Bull 31
Insects, fossil, index to the known Cenozoic, of the world.......Bull 71, pp 237–734
Insects, fossil, index to the known Mesozoic, of the world ....Bull 71, pp 98–237
Insects, fossil, index to the known Paleozoic, of the world...........Bull 71, pp 9–98
Insects, fossil, systematic review of our present knowledge of.....Bull 31, pp 32–101
Insects of special interest from Florissant, Colorado, and other points in the Tertiaries of Colorado and Utah ....Bull 93
Intergrowth of hornblende and pyroxene in glassy rocks ....Ann 12, I, pp 610–617
Intrusive igneous rocks, distribution of, in the Rocky mountains.....Mon XII, p 305
Intrusive igneous rocks; force of intrusion ....Mon XII, pp 298–300
Intrusive igneous rocks of Electric peak, Yellowstone nat. park..Ann 12, I, pp 582–632
Intrusive igneous rocks of the Mosquito range and Leadville district, Colorado.......................................Ann 2, p 226; Mon XII, pp 295–306
Intrusive igneous rocks; traps of New Jersey..................................Bull 67
Inundated lands in the several states, approximate areas of..........Ann 10, I, p 311
Invertebrate paleontology of the Eocene...Bull 83
Invertebrate paleontology of the Neocene.......................................Bull 84
Invertebrate paleontology of the Newark system..............................Bull 85
Invertebrates, fossil; a bibliography of Paleozoic Crustacea from 1698 to 1889..Bull 63

Invertebrates, fossil; a classed and annotated bibliography of fossil insects..Bull 69
Invertebrates, fossil; a review of the fossil Ostreidæ of N. A......Ann 4, pp 273–430
Invertebrates, fossil; a review of the nonmarine fossil Mollusca of North America..Ann 3, pp 403–550
Invertebrates, fossil; Brachiopoda and Lamellibranchiata of the Raritan clays and greensand marls of New Jersey................................Mon IX
Invertebrates, fossil; classified list of the species in the Raritan clays and greensand marls of New Jersey.............................Mon IX, pp 253–264
Invertebrates, fossil; Cretaceous Mollusca from Vancouver id......Bull 51, pp 33–48
Invertebrates, fossil; fauna of the Braintree, Mass., argillites.....Bull 10, pp 43–49
Invertebrates, fossil, from the Pacific coast................................Bull 51
Invertebrates, fossil; Gasteropoda and Cephalopoda of the Raritan clays and greensand marls of New Jersey...Mon XVIII
Invertebrates, fossil; historical geology of the quicksilver belt of California; lists of fossils...Mon XIII, pp 176–225
Invertebrates, fossil; index to the known fossil insects of the world, including myriapods and arachnids...Bull 71
Invertebrates, fossil, list of Cambrian, for the Eureka district..Mon VIII, pp 268–269
Invertebrates, fossil, list of Carboniferous, for the Eureka district........Mon VIII, pp 279–281
Invertebrates, fossil, list of Devonian, for the Eureka district..Mon VIII, pp 274–278
Invertebrates, fossil, list of lower Silurian, for the Eureka district........Mon VIII, pp 270–273
Invertebrates, fossil; lists of species of the upper Devonian, from Tompkins county, New York, to Bradford county, Pennsylvania...........Bull 3, pp 9–29
Invertebrates, fossil; lists of species of the upper Devonian, of the Genesee section, New York ....Bull 41, pp 31–102
Invertebrates, fossil; marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America.......................................Bull 18
Invertebrates, fossil; Mesozoic Mollusca from the southern coast of Alaska..Bull 51, pp 64–70
Invertebrates, fossil; new Cretaceous fossils from California.................Bull 22
Invertebrates, fossil; new Mollusca from the Chico-tejon series of California..Bull 51, pp 11–27
Invertebrates, fossil; notes on the Mesozoic and Cenozoic paleontology of California...Bull 15
Invertebrates, fossil, of California, which have been identified with eastern species..Bull 15, pp 27–29
Invertebrates, fossil, of the St. John formation contained in the Hartt collection at Cornell University.....................................Bull 10, pp 9–42
Invertebrates, fossil, of the Shasta group..........................Bull 15, pp 18–22
Invertebrates, fossil; on Mesozoic fossils.....................................Bull 4
Invertebrates, fossil; on the Cambrian faunas of North America....Bull 10; Bull 30
Invertebrates, fossil, on the fresh-water, of the North American Jurassic.....Bull 29
Invertebrates, fossil; on the higher Devonian faunas of Ontario county, New York...Bull 16
Invertebrates, fossil; on the relation of the Laramie Molluscan fauna to that of the succeeding fresh-water Eocene...Bull 34
Invertebrates, fossil; remarks on the genus Aucella of California................Mon XIII, pp 226–232
Invertebrates, fossil; stratigraphy of the bituminous coal field of Pennsylvania, Ohio, and West Virginia..Bull 65
Invertebrates, fossil; systematic review of our present knowledge of fossil insects, including myriapods and arachnids..................................Bull 31
Invertebrates, fossil; table of distribution of the middle Cambrian fauna...Bull 30, pp 45–48

Invertebrates, fossil; Tertiary and Cretaceous strata of the Tuscaloosa, Tombigbee, and Alabama rivers; species mentioned........................Bull 43

Invertebrates, fossil; the butterflies of Florissant, Colorado....Ann 8, I, pp 433–474

Invertebrates, fossil; the fauna of the lower Cambrian or Olenellus zone..Ann 10, I, pp 509–763

Invertebrates, fossil; the geology of Nantucket; lists of species....Bull 53, pp 34–38

Invertebrates, fossil; the Molluscan fauna of the Puget group......Bull 51, pp 49–63

Invertebrates, fossil; the present condition of knowledge of the geology of Texas; species mentioned..Bull 45

Invertebrates, fossil; the Texan Permian and its Mezozoic types of fossils, with description of species..Bull 77

Invertebrates, fossil and recent; list of marine Mollusca between cape Hatteras and cape Roque..Bull 24

Invertebrates, fossil and recent; on the Quaternary and recent Mollusca of the Great basin..Bull 11, pp 13–49

Iodine, statistics of....................MR 1883–84, pp 854–858; MR 1885, pp 488–490

Iodine, bromine, and chlorine, the indirect estimation of, by the electrolysis of their silver salts, with experiments on the convertibility of the silver salts by the action of alkaline haloids....................Bull 42, pp 89–93

Iowa, altitudes in.........Bull 5, pp 105–112; Bull 72, pp 195, 201, 214–217; Bull 76

Iowa; artesian wells at Dubuque..Ann 11, II, p 262

Iowa, boundary lines of, and formation of state..............Bull 13, pp 31, 117–118

Iowa, brick industry of..................MR 1887, pp 535, 538; MR 1888, pp 559–560

Iowa, building stone from, statistics of...MR 1882, p 451; MR 1887, p 516; MR 1888, pp 540, 544; MR 1889–90, pp 373, 393–394; MR 1891, pp 461, 462, 464, 466

Iowa, Cambrian rocks of..Bull 81, pp 187–188

Iowa, clay industry of..MR 1891, p 514

Iowa, coal area and statistics of...Ann 2, p xxviii; MR 1882, pp 55–56; MR 1883–84, pp 12, 45–46; MR 1885, pp 11, 30; MR 1886, pp 225, 230, 266–268; MR 1887, pp 169, 171, 245–253; MR 1888, pp 169, 171, 262–269; MR 1889–90, pp 147, 215–217; MR 1891, pp 180, 233–243

Iowa, Cretaceous rocks in..Bull 82, pp 142, 165

Iowa; driftless area of the upper Mississippi valley...............Ann 6, pp 199–322

Iowa, formations of northeastern..Ann 11, I, p 234

Iowa, fossils from..................Ann 8, II, p 895; Mon XVI, pp 62–63, 68, 174, 208

Iowa, geologic and paleontologic investigations in......................Ann 5, p 20; Ann 6, p 31; Ann 7, pp 80, 157; Ann 8, I, p 143; Ann 9, pp 106, 108–109; Ann 10, I, pp 148–149; Ann 11, I, p 104

Iowa, geologic maps of, listed................................Bull 7, pp 89, 90, 91, 92

Iowa, gypsum production of..MR 1891, pp 580, 581

Iowa, iron and steel from, statistics of..............................MR 1886, p 18; MR 1887, pp 11, 47–48; MR 1888, p 14

Iowa, lime production of..........................MR 1887, p 533; MR 1888, p 555

Iowa, limestone production of....................................MR 1891, pp 464, 466

Iowa, meteorite from, description and analysis of..................Bull 78, pp 95–97

Iowa, mineral springs of.....................................Bull 32, pp 161–163; MR 1883–84, p 982; MR 1885, p 537; MR 1886, p 716; MR 1887, p 684; MR 1888, p 627; MR 1889–90, p 527; MR 1891, pp 603, 605

Iowa, minerals of, the useful..............MR 1882, pp 681–682; MR 1887, pp 731–732

Iowa, Pleistocene history of northeastern.....................Ann 11, I, pp 189–577

Iowa, rocks in, classification of the..................Bull 80, pp 139–140, 146, 153, 166

Iowa, sandstone production of....................................MR 1891, pp 461–462

Iowa, topographic work in..Ann 9, p 57; Ann 10, I, pp 93–94; Ann 11, I, p 38; Ann 12, I, p 29

Iowa; water from artesian wells at Story city, analyses of............Bull 42, p 148

Ireland, Cambrian rocks of.................Bull 81, p 377
Ireland, fossil plants of, literature of the.................Ann 8, II, pp 687–689
Ireland oölite compared with Kentucky limestone.................MR 1889–90, p 395
Ireland. See, also, Great Britain.
Iridium, bibliography of.................MR 1883–84, pp 588–591
Iridium and platinum, statistics of.................MR 1882, pp 442–444; MR 1883–84, pp 576–591; MR 1885, pp 367–369; MR 1886, pp 222–223; MR 1887, pp 142–143; MR 1888, pp 165–167; MR 1889–90, pp 143–144
Iron and manganese ores, analyses of.................Bull 55, pp 85–87; Bull 60, pp 164–169; Bull 64, pp 51–53
Iron and steel, analyses of.................Bull 55, p 88
Iron and steel from Gruson armor plate and Krupp shell, analyses of.................Bull 55, pp 87–88
Iron and steel in the United States, the manufacture of.................MR 1883–84, pp 246–257; MR 1885, pp 180–195
Iron and steel in the United States, twenty years of progress in the manufacture of.................MR 1891, pp 47–73
Iron and steel industries of the United States in 1887 and 1888.................MR 1887, pp 10–27
Iron and steel industries of the United States in 1888 and 1889.................MR 1888, pp 12–32
Iron and steel industries of the U. S. in 1889, 1890, and 1891.................MR 1889–90, pp 10–22
Iron and steel, prices of, for twenty years.................MR 1891, pp 71–72
Iron and titanium, a note on the separation of.................Bull 27, pp 16–26
Iron-bearing carbonates of the Penokee district, analyses of.................Mon XIX, p 192
Iron-bearing member of the Penokee series, origin of the.................Ann 10, I, pp 393–402; Mon XIX, pp 245–260
Iron-bearing member of the Penokee series, petrographical character of the.................Ann 10, I, pp 380–393; Mon XIX, pp 190–198, 200–245
Iron bisulphite, typical composition of.................MR 1885, p 515
Iron carbonates, cherty, origin of.................Ann 10, I, p 395
Iron-carburets, electrical and magnetic properties of the.................Bull 14; Bull 27, pp 30–50
Iron-carburets, physical characteristics of the.................Ann 4, pp 53–59; Bull 35
Iron, coal, etc., statistics of.................Ann 1, pp 72–73; Ann 2, pp xxvi–xxxi
Iron industry, the American, from its beginning in 1619 to 1886.................MR 1886, pp 23–38
Iron mica from Pike's peak.................Bull 55, pp 17–18
Iron ore and its products.................MR 1882, pp 108–144
Iron ore, brown, from near Timonium, Maryland, analysis of.................Bull 27, p 72
Iron ore, brown, from Randolph county, W. Va., analyses of.................Bull 27, pp 72–73
Iron ore from Iron mountain, Missouri, composition of.................MR 1889–90, p 47
Iron ore, magnetic, from near Bozeman, Montana, analysis of.................Bull 9, p 17
Iron-ore mining in 1887.................MR 1887, pp 30–57
Iron-ore supply for twenty years, outputs of prominent sources of.................MR 1891, p 41
Iron ore, pig iron, steel, and coal, the world's production of, by countries.................MR 1882, p 109; MR 1883–84, pp 256–257; MR 1885, pp 193–194; MR 1886, pp 21–22, 98–103; MR 1887, pp 18–20; MR 1888, pp 28–31; MR 1889–90, pp 21–22; MR 1891, p 73
Iron ores, action of water in the formation of.................Ann 10, I, pp 415–417
Iron ores from Louisiana, analyses of.................Bull 42, pp 144–145
Iron ores from West Virginia, analyses of.................Bull 90, p 74
Iron ores, Gogebic, analyses of.................Mon XIX, pp 90–91
Iron ores in the United States.................MR 1883–84, pp 257–281
Iron ores of Alabama in their geological relations.................MR 1882, pp 149–161
Iron, ores of, from various localities, analyses of.................Bull 78, pp 125–127
Iron ores of the lake Superior region, origin of the.................Bull 86, pp 170–173
Iron ores of Wisconsin and Michigan.................Ann 10, I, pp 409–422
Iron, separation of, in rock analyses.................Bull 78, pp 87–90
Iron sows or salamanders, analyses of.................Mon XII, p 723

Iron, statistics of......................MR 1882, pp 108–171; MR 1883–84, pp 246–311; MR 1885, pp 180–199; MR 1886, pp 11–103; MR 1887, pp 10–57; MR 1888, pp 12–35; MR 1889–90, pp 10–47; MR 1891, pp 10–73

Iron trade, the American, in 1886 ....MR 1886, pp 11–22

Iron. See, also, Steel.

Irons, two new meteoric, and an iron of doubtful nature..........Bull 42, pp 94–97

Irrigated areas in the arid region of the United States, map showing.............Ann 11, II, pp ii–iii

Irrigated areas in the United States, table of, by states............Ann 11, II, p 205

Irrigation; arid region of United States, location of, and cause of aridity......Ann 12, II, pp 219–220

Irrigation as affecting humidity....................................Ann 12, II, p 234

Irrigation by means of artesian wells......Ann 5, pp 148–150; Ann 11, II, pp 257–278

Irrigation; canal lines to divert water from Snake river in Idaho ....Ann 11, II, pp 190–200

Irrigation; drainage basins, classification of ....Ann 12, II, pp 232–234

Irrigation; floods, relative amount, time, and intensity of .....Ann 12, II, pp 227–230

Irrigation; hydrography of the arid regions of the United States.........Ann 10, II, pp 36, 78–90; Ann 11, II, pp 1–110; Ann 12, II, pp 213–361

Irrigation in arid region of United States, amount of land redeemable by....Ann 11, II, pp 203–205

Irrigation in India...Ann 12, II, pp 363–561

Irrigation in India, list of authors of works on....................Ann 12, II, pp 371–373

Irrigation, increase of land values by ....Ann 11, II, p 252

Irrigation; interdistrict, interstate, and international problems and their solution ....Ann 11, II, pp 252–257

Irrigation literature; a list of books, pamphlets, and articles on irrigation and allied subjects..Ann 11, II, pp 345–388

Irrigation of the arid lands, considerations touching the problem of the....Ann 10, II, pp 1–16, 29–33

Irrigation; rainfall and river flow, relation of..................Ann 12, II, pp 230–231

Irrigation; reservoir sites and irrigable lands in California, Nevada, Colorado, Idaho, Montana, and New Mexico reported by topographers..Ann 10, II, pp 58–65; Ann 11, II, pp 297–298, 299–301, 303–304, 305, 306–308, 310; Ann 12, II, pp 10–212

Irrigation; river measurements, index map of..................Ann 12, II, pp 222–223

Irrigation; selection and segregation of lands, importance of, to the settlement of the best lands...........................Ann 11, II, pp 251, 287–289

Irrigation, storage of water for purposes of...................Ann 12, II, pp 224–226

Irrigation survey, (first) annual report of director on, for 1888–89..Ann 10, II, pp 1–65

Irrigation survey, (second) annual report of director on, for 1889–90...........Ann 11, II, pp 1–388

Irrigation survey, (third) annual report of director on, for 1890–91..Ann 12, II, pp 1–576

Irrigation survey, law establishing the ....Ann 10, II, p 38

Irrigation survey, plans, methods, underlying principles, and operations of the ....Ann 10, II, pp 33–48; Ann 11, II, pp 278–287; Ann 12, II

Irrigation survey, preliminary report on the (reprint of) ....Ann 10, II, pp 15–29

Irving (R. D.), administrative report for 1882–83.....................Ann 4, pp 28–34

Irving (R. D.), administrative report for 1883–84.....................Ann 5, pp 24–28

Irving (R. D.), administrative report for 1884–85.....................Ann 6, pp 40–48

Irving (R. D.), administrative report for 1885–86.....................Ann 7, pp 68–76

Irving (R. D.), administrative report for 1886–87................Ann 8, I, pp 132–141

Irving (R. D.), Archean formations of the northwestern states ....Ann 5, pp 175–242

Irving (R. D.), classification of early Cambrian and pre-Cambrian..Ann 7, pp 365–454

Irving (R. D.), copper-bearing rocks of lake Superior......Ann 3, pp 89–188; Mon V

Irving (R. D.), death and biographic sketch of......................Ann 9, pp 38–42, 79

Irving (R. D.), introduction to Williams's "Greenstone-schist areas of the Menominee and Marquette regions of Michigan" .... Bull 62, pp 11–30

Irving (R. D.) and Chamberlin (T. C.), observations on the junction between the Eastern sandstone and the Keweenaw series on Keweenaw point, lake Superior .... Bull 23

Irving (R. D.) and Van Hise (C. R.), secondary enlargements of mineral fragments in certain rocks .... Bull 8

Irving (R. D.) and Van Hise (C. R.), the Penokee iron-bearing series of Michigan and Wisconsin .... Ann 10, I, pp 341–507; Mon XIX

Isometrics of liquids .... Bull 96, pp 33–62

Italy, antimony production of .... MR 1883–84, p 646

Italy, coal output of, compared with that of other countries .... MR 1882, p 5; MR 1883–84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73

Italy, copper production of ..... MR 1883–84, p 356; MR 1885, p 228; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1889–90, p 73; MR 1891, pp 100, 102

Italy, fossil plants of, literature of the .... Ann 8, II, pp 707–716

Italy, gold and silver production of, compared with that of other countries .... MR 1883–84, pp 319–320

Italy, iron and steel production of, compared with that of other countries .... MR 1882, p 109; MR 1883–84, p 257; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889–90, p 21; MR 1891, p 73

Italy, lead production of .... MR 1883–84, p 434; MR 1885, pp 264, 269–270

Italy, manganese production of .... MR 1886, pp 202–203; MR 1887, p 161; MR 1889–90, p 130

Italy, mining law of .... MR 1883–84, p 999

Italy, quicksilver mines and production of...... Mon XIII, pp 5–6, 14, 33–36; MR 1888, p 106; MR 1891, pp 123–124

Italy, sulphur production of .... MR 1882, p 578; MR 1883–84, p 868; MR 1885, p 500; MR 1889–90, pp 515–517

Italy, tin production of .... MR 1883–84, p 618

Italy, zinc production of .... MR 1882, p 358

Jackson beds of Mississippi and Louisiana .... Bull 83, pp 68–69, 76

Jackson-Vicksburg limestone .... Ann 12, I, pp 412–413

Jacksonboro limestone of Georgia .... Bull 84, pp 83–84

Jade, analyses of .... Bull 60, pp 123–127

Jade and pectolite from Alaska, analyses of .... Bull 9, pp 9–10

Japan, antimony mines of .... MR 1883–84, p 649

Japan, coal output of, compared with that of other countries .... MR 1882, p 5; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189

Japan, copper production of .... MR 1883–84, p 356; MR 1885, p 229; MR 1886, p 128; MR 1887, p 88; MR 1888, p 73; MR 1889–90, p 74; MR 1891, pp 101, 102

Japan, fossil plants of, literature of the .... Ann 8, II, pp 788–790

Japan, gold and silver production of, compared with that of other countries .... MR 1883–84, pp 319, 320

Japan, natural gas in .... MR 1888, pp 511–512

Japan, petroleum fields in .... MR 1888, pp 474–478

Japan, quicksilver deposits in .... Mon XIII, p 47

Japan, tin production of .... MR 1883–84, p 623

Jarosite from Tintic mining district, Utah .... Bull 20, pp 86–88

Java, fossil plants of, literature of the .... Ann 8, II, pp 803–805

Jefferson river basin, hydrography of .... Ann 11, II, pp 40–41

Jemez river, New Mexico, irrigation possibilities along the..... Ann 12, II, pp 274–275

Jenney (W. P.), administrative report for 1889–90 .... Ann 11, I, pp 80–81

Jenney (W. P.), administrative report for 1890–91 .... Ann 12, I, p 96

John Day group of rocks of Oregon .... Bull 84, pp 281–282

Johnson (L. C.), administrative report for 1882–83 .... Ann 4, pp 48–50
Johnson (L. C.), administrative report for 1885–86 .... Ann 7, pp 103–104
Johnson (L. C.), administrative report for 1886–87 .... Ann 8, i, pp 165–166
Johnson (L. C.), administrative report for 1887–88 .... Ann 9, pp 110–111
Johnson (L. C.), the iron regions of northern Louisiana and eastern Texas. See p 323 of this bulletin.
Johnson (L. C.) and Smith (E. A.), Tertiary and Cretaceous strata of the Tuscaloosa, Tombigbee, and Alabama rivers .... Bull 43
Joint planes of cape Ann district, Massachusetts .... Ann 9, pp 583–588, 597–602
Joints and jointing in the Lahontan beds .... Mon xi, pp 132, 162–163
Joints in the Bonneville beds .... Mon i, pp 211–213
Jones (J. H.), anthracite coal, statistics of .... MR 1889–90, pp 242–252; MR 1891, pp 288–304
Jurassic. See Jura-trias.
Jura-trias and associated traps of the New Jersey region .... Bull 67
Jura-trias area of Virginia, the geology of the .... Mon vi, pp 1–9
Jura-trias; Aucella in California .... Mon xiii, pp 226–232
Jura-trias; auriferous slates of the Lassen peak district, Cal .... Ann 8, i, pp 404–407
Jura-trias bitumen deposits .... Ann 11, i, p 598
Jura-trias flora of North Carolina .... Mon vi, pp 97–128
Jura-trias; fossil insects of Triassic age found in the Leadville dist ... Mon xii, p 71
Jura-trias; fossil Mollusca of North America, nonmarine .... Ann 3, pp 411–486
Jura-trias fossils from Alaska .... Bull 4, pp 10–15
Jura-trias fossils from the Texan Permian, types of .... Bull 77
Jura-trias in California .... Ann 8, ii, pp 972–982; Bull 19
Jura-trias in the region of the Uinta mountains .... Ann 9, pp 688–689
Jura-trias; Jurassic flora in the older Mesozoic of Virginia and North Carolina .... Mon vi, pp 92–93, 94, 95, 122–123, 127, 128
Jura-trias; Jurassic, fresh-water invertebrates of the North American .... Bull 29
Jura-trias; Jurassic nonconformity in the Gunnison region of Col .... Ann 6, pp 64–65
Jura-trias; Jurassic Ostreidæ of North America .... Ann 4, pp 289–290
Jura-trias Mollusca from the southern coast of Alaska .... Bull 51, pp 64–70
Jura-trias; Newark system, a correlation essay on the .... Bull 85
Jura-trias; Newark system in the New Jersey region, the relations of the traps of the .... Bull 67
Jura-trias of Texas .... Bull 45, pp 69–70
Jura-trias of the Grand canyon dist ..... Ann 2, pp 64, 77–83; Mon ii, pp 16, 34–43, 199
Jura-trias, red color of the, origin of the .... Bull 52
Jura-trias; Rhætic formation in Virginia .... Mon xv, pp 34, 58
Jura-trias; Rhætic of Germany and France and the Triassic of the United States, parallelism of the .... Mon xiv, pp 10–11, 13
Juras-trias; Rhætic plants, or those nearly allied to such, from the Mesozoic of Virginia and North Carolina .... Mon vi
Jura-trias; Trias in southwestern Kansas .... Bull 57, pp 20–27
Jura-trias; Trias of the Atlantic slope, flora of the .... Mon xv
ura-trias; Trias of Virginia and North Carolina and flora therefrom ...... Mon vi, pp 2, 92–93, 95, 100–101, 125–126
Jura-trias; Triassic of the Connecticut valley, structure of the .... Ann 7, pp 455–490
Jura-trias; Triassic rocks of New Jersey and the Connecticut valley, fossil fishes and plants of the .... Mon xiv
Jura-trias; Triassic rocks of New Jersey and the Connecticut valley, geological relations and equivalents of the .... Mon xiv, pp 1–15
Jura-trias system of New Mexico .... Ann 6, pp 135–136, 184–185
Jura-trias. See, also, Mesozoic.
Kaibab plateau, Grand canyon district, description, structural geology, and evolution of the .... Ann 2, pp 72, 127–141; Mon ii, pp 10, 183–198

Kainite, analyses of.......................................MR 1883-84, pp 816, 817

Kanab plateau, Grand canyon district, description of the..................Ann 2, pp 70, 72, 217; Mon II, pp 10, 13, 23

Kanab section, Colorado river..........................Ann 2, p 217; Mon XII, p 57

Kansas, a geological reconnaissance in southwestern..........................Bull 57

Kansas, altitudes in.................................Bull 5, pp 113-119; Bull 76

Kansas, artesian wells of, list of the ....Ann 11, II, p 271; Bull 57, pp 13, 30, 48

Kansas, boundary lines of, and formation of territory..............Bull 13, pp 31, 119

Kansas, building stone from, statistics of............MR 1882, p 451; MR 1887, p 516; MR 1888, pp 540, 544; MR 1889-90, pp 374, 394; MR 1891, pp 461, 462, 464, 466

Kansas, coal area and statistics of.................................Ann 2, p xxviii; MR 1883-84, pp 12, 46-47; MR 1885, pp 11, 30-32; MR 1886, pp 225, 230, 268-270; MR 1887, pp 169, 171, 253-256; MR 1888, pp 169, 171, 269-276; MR 1889-90, pp 147, 217-218; MR 1891, pp 180, 243-247

Kansas, coke in, the manufacture of...........................MR 1883-84, p 165; MR 1885, pp 80, 91; MR 1886, pp 378, 384, 398; MR 1887, pp 383, 389, 401; MR 1888, pp 395, 400, 410; MR 1891, pp 360-361, 366, 380-381

Kansas, Cretaceous rocks of..............................Bull 82, pp 154, 159, 160, 163

Kansas, fossils from ....Ann 8, II, pp 899-901; Mon XVII; Bull 77, pp 26, 27, 28, 29

Kansas, geologic and paleontologic investigations in.....................Ann 3, p 50; Ann 5, p 49; Ann 6, pp 32, 72; Ann 7, pp 110-111; Ann 8, I, pp 169-170; Ann 9, p 104; Ann 10, I, pp 154-155

Kansas, geologic map of, listed..Bull 7, p 137

Kansas, gypsum production of..................................MR 1891, pp 580, 581

Kansas, iron and steel from, statistics of..................................MR 1882, pp 120, 125, 133, 135, 136, 137; MR 1885, pp 184, 185

Kansas; latitude and longitude of Spearville, determined...Ann 11, I, p 129; Bull 70

Kansas; latitudes and longitudes of certain points in Missouri, Kansas, and New Mexico ....Bull 49

Kansas, lead from, statistics of.......................Ann 2, XXVIII; MR 1882, p 312; MR 1883-84, pp 416, 426-427; MR 1885, p 248; MR 1886, p 147; MR 1887, p 110

Kansas; limestone from Cowley county, analysis of...............MR 1889-90, p 394

Kansas; limestone from Iola, analysis of................................Bull 78, p 124

Kansas; limestone production of...............................MR 1891, pp 464, 466

Kansas; marl from Trego county, analysis of ....Bull 27, p 71

Kansas; meteoric stone from Washington county, description and analysis of ....Bull 90, pp 45-46

Kansas, meteorite from, description and analysis of......................Bull 78, p 94

Kansas, mineral springs of............Bull 32, pp 171-175; MR 1883-84, p 982; MR 1885, p 537; MR 1886, p 716; MR 1887, p 684; MR 1888, p 627; MR 1889-90, p 527; MR 1891, pp 603, 605

Kansas, minerals of, the useful.............MR 1882, pp 682-684; MR 1887, p 732-733

Kansas, natural-gas localities and statistics of.............MR 1885, p 168; MR 1886, pp 514-515; MR 1887, pp 466, 496-498; MR 1889-90, p 367; MR 1891, p 438

Kansas, Neocene beds of.......................................Bull 84, pp 299-301

Kansas; salt from Hutchinson, analysis of..............................Bull 60, p 171

Kansas, salt from, statistics of.................MR 1882, pp 532-534; MR 1887, p 622; MR 1888, pp 597-598, 607-609; MR 1889-90, pp 482, 488; MR 1891, p 572

Kansas, sandstone production of...............................MR 1891, pp 461, 463

Kansas, topographic work in............Ann 6, p 11; Ann 7, pp 53-54, 112; Ann 8, I, p 103; Ann 9, p 56; Ann 10, I, p 93; Ann 11, I, p 39; Ann 12, I, pp 29-30, 47

Kansas, zinc and zinc works in, statistics of........Ann 2, p xxix; MR 1882, pp 347, 382; MR 1883-84, p 475; MR 1885, p 273; MR 1886, pp 154, 156; MR 1887, p 113; MR 1888, p 92; MR 1889-90, p 88

Kansas and Colorado, Arkansas river basin in, irrigation problems relating to the ....Ann 11, II, pp 210-214

and Nebraska, the Permian problem in..................Bull 80, pp 193–212
from Aiken, South Carolina, analysis of......................Bull 27, p 63
from Arkansas, Alabama, and Georgia, analyses of............Bull 78, p 120;
MR 1891, p 517
rom the Waterfall mine, Gunnison county, Colorado, description and
alysis of..Bull 60, p 136
residual or rock ....MR 1891, pp 484–486
e from San Juan county, Colorado, description and chemical compo-
tion of...Bull 20, pp 97–99
e in the Eureka vein.....................................Bull 20, pp 67–68
ation, experiments on.........................Mon III, pp 290–308, 397–400
ation hypothesis to account for the heat of the Comstock lode........Ann 2,
pp 312–313, 325–330; Mon III, pp 216, 231–237, 388–389
ation, thermal effect of.......................................Ann 2, pp 325–330
river, California, hydrography of...........................Ann 12, II, p 320
e group of rocks of New Hampshire.....................Bull 86, pp 353–355
. E.), earthquakes in California in 1869................................Bull 68
n series of rocks of the Rainy lake region.........Bull 86, pp 65–67, 162–167
.), gold and silver, statistics of..........................MR 1889–90, pp 48–55
y, altitudes in..................................Bull 5, pp 120–124; Bull 76
y, asphaltum or bituminous rock production of.............MR 1891, p 452
y, boundary lines of, and admission of state...........Bull 13, pp 30, 109–110
y, brick industry of...............MR 1887, pp 535, 538; MR 1888, pp 560, 569
y, building stone from, statistics of........MR 1882, p 451; MR 1887, p 516;
MR 1888, p 540; MR 1889–90, pp 373, 395–396; MR 1891, pp 461, 462, 464, 466
, cement manufacture in.................MR 1887, p 527; MR 1888, p 551;
MR 1889–90, p 461; MR 1891, p 532
, coal area and statistics of ....Ann 2, p xxviii;
MR 1882, pp 56–58; MR 1883–84, pp 12, 47–49; MR 1885, pp 11, 32; MR 1886, pp 225, 230, 270–272; MR 1887, pp 169, 171, 256–263; MR 1888, pp 169, 171, 276–280; MR 1889–90, pp 146, 219–221; MR 1891, pp 180, 247–255
, coke in, the manufacture of.....................MR 1883–84, pp 166–168;
MR 1885, pp 80, 91–92; MR 1886, pp 378, 384, 398–401; MR 1887, pp 383, 389, 401–405; MR 1888, pp 395, 400, 410–411; MR 1891, pp 360–361, 366, 381
, Eocene deposits in..................................Bull 83, pp 71–73, 83
, fossils from...Ann 8, II, pp 882–884;
Mon XVI, pp 59, 65, 121, 122, 129, 171, 197, 202
, geologic and paleontologic investigations in............Ann 6, pp 35, 36;
Ann 11, I, pp 75, 104; Ann 12, I, pp 88, 107
, geologic maps of, listed...............Bull 7, pp 107, 108, 109, 110, 112, 168
; glacial boundary in western Pennsylvania, Ohio, Kentucky, Indi-
, and Illinois...Bull 58
, iron and steel from, statistics of.......................Ann 2, p xxviii;
MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, pp 252, 278, 279; MR 1885, pp 182, 184, 186; MR 1886, pp 18, 33, 96; MR 1887, p 11; MR 1888, pp 14, 23; MR 1889–90, pp 10, 12, 17; MR 1891, pp 12, 27, 61
, lime production of..MR 1887, p 533
; limestone from Bowling Green, compared with oölite from Ire-
l ....MR 1889–90, p 395
limestone production of.............................MR 1891, pp 464, 466
marl deposits in..MR 1886, p 620
mineral springs of..................................Bull 32, pp 106–118;
MR 1883–84, p 982; MR 1885, p 538; MR 1886, p 716; MR 1887, p 684; MR 1888, p 627; MR 1889–90, p 527; MR 1891, pp 603, 605
minerals of, the useful.........MR 1882, pp 684–686; MR 1887, pp 733–735

Kentucky, natural-gas localities and statistics of..............MR 1887, pp 489-492; MR 1888, pp 506-509; MR 1891, p 438

Kentucky; peridotite of Elliott county..................Bull 38; Bull 42, pp 136-137

Kentucky, petroleum in, localities and statistics of ....MR 1882, pp 189, 216; MR 1883-84, p 216; MR 1885, p 147; MR 1888, p 463; MR 1889-90, pp 292, 350-353; MR 1891, pp 405, 407, 434-435

Kentucky; phosphatic limestones of..........................Bull 46, pp 116-117

Kentucky, salt from, statistics of...............MR 1882, pp 532-534; MR 1891, p 572

Kentucky, sandstone production of...........................MR 1891, pp 461, 462

Kentucky, topographic work in.................................Ann 4, pp 13-15; Ann 6, p 9; Ann 7, p 51; Ann 8, I, p 102; Ann 9, pp 54, 55; Ann 10, I, p 91; Ann 11, I, p 37; Ann 12, I, p 27

Kentucky; water from near Frankfort, analysis of....................Bull 64, p 57

Keratophyr from Marblehead neck, Massachusetts, analysis of........Bull 78, p 121

Kerguelen land, silicified wood from................................Ann 8, II, p 817

Kern river, California, hydrography of..............................Ann 12, II, p 319

Kerr (W. C.), the minor metals of North Carolina...............MR 1882, pp 659-661

Keweenaw series on Keweenaw point, lake Superior, the junction between the Eastern sandstone and the...Bull 23

Keweenawan rocks of lake Superior, chronologic list of works that embrace references to the ....Mon V, pp 14-23, 431-432

Keweenawan rocks of the lake Superior basin, extent and general nature of the ....Ann 3, pp 93-188; Mon V, pp 24-409; Bull 86, pp 160-162

Keweenawan. See, also, Algonkian.

King (C.), administrative report for 1880-81.......................Ann 2, pp 44-46

King (C.), administrative report for 1881-82.........................Ann 3, pp 3-9

King (C.), quoted, on glacers of mount Shasta.....................Ann 5, pp 329-331

King (C.), quoted, on the Comstock lode...........................Mon III, pp 24-26

King (C.), production of precious metals in the United States.....Ann 2, pp 331-401

King (C.), report as director for 1879-80............................Ann 1, pp 3-79

King (C.), resignation of, from directorship...............................Ann 2, p xi

Kings river, California, hydrography of............................Ann 12, II, p 320

Kingston group of rocks of New Brunswick.....................Bull 86, pp 232-238

Kirchhoff (C.), jr., copper, statistics of.....MR 1886, pp 109-139; MR 1887, pp 66-97; MR 1888, pp 43-77; MR 1889-90, pp 56-77; MR 1891, pp 81-102

Kirchhoff (C.), jr., lead, statistics of......MR 1886, pp 140-153; MR 1887, pp 98-112; MR 1888, pp 79-91; MR 1889-90, pp 78-87; MR 1891, pp 103-110

Kirchhoff (C.), jr., the copper industry of the United States....MR 1882, pp 213-257; MR 1883-84, pp 322-374; MR 1885, pp 208-243

Kirchhoff (C.), jr., the lead industry of the United States......MR 1882, pp 306-323; MR 1883-84, pp 411-440; MR 1885, pp 244-271

Kirchhoff (C.), jr, the zinc industry of the United States.......MR 1882, pp 346-358; MR 1883-84, pp 474-491; MR 1885, pp 272-283

Kirchhoff (C.), jr., zinc, statistics of.....MR 1886, pp 154-159; MR 1887, pp 113-117; MR 1888, pp 92-96; MR 1889-90, pp 88-93; MR 1891, pp 111-116

Knowlton (F. H.), fossil wood and lignite of the Potomac formation..........Bull 56

Knowlton (F. H.), Lesquereux's "Flora of the Dakota group," edited by...Mon XVII

Kotschubeite from California.................................Bull 61, pp 27-30

Kowak clays of Alaska.......................................Bull 84, pp 265-268

Kübel (S. J.), administrative report for 1889-90..............Ann 11, I, pp 134-136

Kübel (S. J.), administrative report for 1890-91..............Ann 12, I, pp 138-140

Kunz (G. F.), American gems and precious stones, statistics of...........MR 1882, pp 483-499; MR 1883-84, pp 723-782; MR 1885, pp 437-444; MR 1886, pp 595-605; MR 1887, pp 555-579; MR 1888, pp 580-585; MR 1889-90, pp 445-448; MR 1891, pp 539-551

Kyanite from Clip, Arizona, analysis of ....Bull 78, p 120

lorian system of rocks in New Hampshire .... Bull 86, pp 351–355
ites and intrusive sheets, discussion on.................... Mon XII, pp 295–304
ites in the Mosquito range, Colorado, occurrence of .... Mon XII,
pp 149, 155, 164, 190, 193, 296, 301, 305, 306
ral history of Mono basin, California .... Ann 8, I, pp 287–319
al sediments, color of .... Mon XI, p 169
te formation of Virginia, North Carolina, South Carolina, Georgia, Ala-
ama, Mississippi, Louisiana, and Texas, the features, history, etc., of
le... Ann 12, I, pp 347–521;
Bull 84, pp 66–67, 74, 80–81, 84–85, 159–160, 166–167, 170, 175, 189–191
ge group of Tennessee and Kentucky.................. Ann 12, I, pp 499–500;
Bull 84, pp 170–172
n basin, analyses of clays from the .... Mon XI, p 128
n basin, analyses of waters of lakes and rivers of the........... Mon XI, p 225
n beds, volcanic dust from the, analysis of .... Bull 9, p 14
n, lake, chemical deposits of.......... Ann 3, pp 211–215; Mon XI, pp 188–222
n, lake, crystallographic study of the thinolite of...................... Bull 12
n, lake, geological history of......................... Ann 3, 189–235; Mon XI
sins in relation to climate .... Ann 2, pp 173–174
sins, the formation of .... Mon I, pp 2–5; Mon XI, pp 23–24
nneville, contributions to the history of .... Ann 1, pp 23–25, 74–75
Ann 2, pp xvi–xvii, 167–200; Mon I
neville, Molluscan fauna of.. Bull 11
neville, sediments of, analysis of the....... Ann 2, p 177; Mon I, pp 201–202
ontan, chemical deposits of.......... Ann 3, pp 211–215; Mon XI, pp 188–222
ontan, crystallographic study of the thinolite of..................... Bull 12
ontan, geological history of.................... Ann 3, pp 195–233; Mon XI
o, California, analysis of water of............ Ann 8, I, p 293; Bull 42, p 149
o, California, deposits of.................................... Mon XI, pp 221–222
o, California, description and history of .... Ann 8, I, pp 269–320
o, California, obsidian of.. Ann 7, p 292
o, California, old shorelines of... Mon I, p 16
es, topographic features of............................ Ann 2, pp 171–174; Ann 3,
pp 204–208; Ann 5, pp 69–123; Mon I, pp 23–89; Mon XI, pp 87–99
erior basin, geological maps of the.................. Ann 3, pp 92–93, 172–173
erior, copper-bearing rocks of .... Ann 1, pp 70–71;
Ann 2, pp xxxi, xxxiv; Ann 3, pp 89–188; Mon V
rior, fluctuations of, from 1870 to 1888............................. Bull 72, p 18
rior sandstone... Bull 86, pp 157–160
rior synclinal.. Mon V, pp 410–418
rior. See, also, Michigan; Minnesota; Wisconsin.
e as a reservoir site for irrigation purposes .... Ann 11, II, pp 169–172
e, water of, analysis of the.. Mon XI, p 42
r, composition of... Mon I, pp 204–208
ene, of Wyoming and Utah .... Mon X, pp 1–8
hening of, by desiccation .... Ann 2, pp 177–180; Ann 3,
pp 224–230; Mon I, pp 208–209, 229, 258; Mon XI, pp 224–230
e Great basin, chemistry of .... Ann 4, pp 454–455
osed, analyses of the waters of.................................... Mon XI, p 176
ternary, of the Great basin, sketch of the......................... Bull 11, pp 9–12
, in Nevada... Mon XI, pp 73–80
nchiata; description of certain aberrant forms of the Chamidæ
the Cretaceous rocks of Texas.. Bull 4, pp 5–9
nchiata, description of species of, from the middle Cambrian of
America.. Bull 30, pp 123–125

Lamellibranchiata, fossil, of the Raritan clays and greensand marls of New Jersey .... Mon IX, pp 17–252
Lamellibranchiata from the Carboniferous of the Eureka district, Nevada....... Mon VIII, pp 225–254
Lamellibranchiata from the Devonian of the Eureka district, Nevada....... Mon VIII, pp 164–182
Lamellibranchiata from the lower Silurian of the Eureka district, Nevada....... Mon VIII, pp 76–78
Lamellibranchiata of the Eocene .... Bull 83
Lamellibranchiata of the Great basin .... Bull 11, pp 14–16
Lamellibranchiata of the higher Devonian of Ontario county, New York........ Bull 16, pp 23, 24, 58–62
Lamellibranchiata of the Olenellus zone........................ Ann 10, I, pp 614–615
Lamellibranchiates of New Jersey formations recognized in other localities, table showing.. Mon XVIII, pp 28–29
Lamellibranchiates, table showing the number of genera and species of, under each family occurring in each of the several marl-beds of New Jersey...... Mon XVIII, pp 24–25
Lamination of acid lavas, cause of........................ Ann 7, pp 260, 286
Lampblack, specific gravity of........................ Bull 42, pp 132–135
Landslides, classification of........................ Ann 7, p 631
Landslides, theory of........................ Mon III, p 187
Lapidary work, aboriginal, in Oregon........................ MR 1891, p 551
La Plata mountains, literature of the geology of the............. Bull 86, pp 323–324
Laramie flora, types of the.. Bull 37
Laramie formation, discussion of the........................ Bull 82, pp 145–153
Laramie group, historical review of opinion concerning the........... Ann 6, 406–433
Laramie group, nature and extent of the........................ Ann 6, pp 433–436
Laramie group, recent collections of fossil plants from the........ Ann 6, pp 536–557
Laramie group, stratigraphy and correlation of the............. Bull 82, pp 127, 148; Bull 83, pp 111–134, 145–146
Laramie group, synopsis of the flora of the........................ Ann 6, pp 399–557
Laramie hills, literature of the geology of the........... Bull 86, pp 272, 273, 275, 276
Laramie hills. See, also, Black hills.
Laramie Molluscan fauna, the relation of the, to that of the succeeding fresh-water Eocene and other groups.. Bull 34
Laramie Ostreidæ.. Ann 4, pp 307–308
Laramie, Senonian, and Eocene plants, table of distribution of, and discussion thereof.. Ann 6, pp 443–536
Laramie. See, also, Cretaceous.
Lassen peak district, California, geology of the......... Ann 8, I, pp 395–432; Bull 33
Latitudes and longitudes of certain points in Missouri, Kansas, and New Mexico .... Bull 49
Laumontite from Table mountain, Colorado, description and chemical composition of.. Bull 20, pp 16–17
Laurentian system, history of the term........................ Bull 86, pp 462, 470–474
Laurentian, the original........................ Bull 86, pp 23–50, 497–498
Laurentian and Huronian, relations of the Keweenawan rocks to the........... Ann 3, pp 156–173
Laurentian and Huronian, relations of the Penokee iron-bearing series of Michigan and Wisconsin to the........................ Ann 10, I, pp 458–464; Mon XIX, pp 45–46, 58, 59–61, 76–77
Laurentian. See, also, Algonkian; Archean.
Lava, aa type of, characteristics of the........................ Ann 4, p 95
Lava cascades in the Grand canyon of the Colorado....... Mon II, pp 85, 92, 106, 116

Lava flows, modern, of Mono valley, California .... Ann 8, I, pp 372–377

Lava, pahoehoe type of, characteristics of the .... Ann 4, p 95

Lava, peculiar, from a late volcanic eruption in northern California .... Bull 79

Lavas, basaltic, of the Bonneville basin .... Mon I, pp 319–336

Lavas, common source of .... Mon XX, 267

Lavas from near Lassen peak, California, analyses of .... Bull 60, pp 155–157

Lavas of California not fused sediments .... Mon XIII, p 174

Lavas of the Coast ranges of California .... Mon XIII, pp 145–164

Lavas of the Eureka district, Nevada, chemical composition of .. Mon XX, pp 264–267

Lavas of the Eureka district, Nevada, manner of occurrence of .. Mon XX, pp 243–249

Lavas of the volcanoes of the Hawaiian islands .... Ann 4, pp 84–98, etc.

Lavas, recent, of the San Jose valley, New Mexico .... Ann 6, pp 179–182

Law establishing and extending the United States Geological Survey ..... Ann 1, pp 3–4; Ann 4, p XIII

Law establishing the Irrigation Survey .... Ann 10, II, p 38

Law, mining, historical sketch of .... MR 1883–84, pp 988–1004

Law, mining, of the states east of the Mississippi .... MR 1886, pp 722–790

Law; tariff of March 3, 1883, schedules from the .... MR 1882, pp 777–787

Laws governing the printing and distribution of the publications of the Geological Survey. See pp 11–14 of this bulletin.

Lead, argentiferous, the smelting of, in the far West .... MR 1882, pp 324–345

Lead deposits of Cumberland and Derbyshire, England .... Mon VII, pp 67–68

Lead deposits of Leadville, Colorado .... Mon VII, p 66

Lead deposits of Missouri .... Mon VII, p 66

Lead deposits of Raibl, Corinthia .... Mon VII, pp 68, 102

Lead deposits of the Great basin .... Mon VII, pp 64–65

Lead deposits of the upper Mississippi .... Mon VII, p 65

Lead deposits of upper Silesia .... Mon VII, p 68

Lead deposits of Westphalia .... Mon VII, p 68

Lead, desilverizing, in the U. S., recent improvements in ... MR 1883–84, pp 462–473

Lead in eruptive rocks .... Mon XII, p 578

Lead industry of the United States .... MR 1882, pp 306–323; MR 1883–84, pp 411–434; MR 1885, pp 244–262

Lead of foreign countries, statistics of .... MR 1882, pp 321–323; MR 1883–84, pp 434–440; MR 1885, pp 262–271

Lead-producing regions of the U. S .... MR 1887, pp 103–110; MR 1888, pp 85–89

Lead, production of, in the United States since 1825 .... MR 1891, pp 103–104

Lead-silver deposits of Eureka, Nevada .... Mon VII

Lead-silver deposits of the Leadville district, Colorado .... Mon XII, pp 367–584

Lead slags, analyses and chemical properties of .... MR 1883–84, pp 447–460

Lead, statistics of .... MR 1882, pp 306–345; MR 1883–84, pp 411–473; MR 1885, pp 244–271; MR 1886, pp 140–153; MR 1887, pp 98–112; MR 1888, pp 78–91; MR 1889–90, pp 78–87; MR 1891, pp 103–110

Leadville, Colorado, and vicinity, geological map of .... Ann 2, pp 240–241

Leadville, Colorado, chemistry of the rocks and ores of .... Mon XII, pp 585–608

Leadville, Colorado, geology and mining industry of .... Ann 1, pp 69–70; Ann 2, pp XX–XXIII, 201–290; Mon XII

Leadville, Colorado, metallurgy of .... Mon XII, pp 609–751

Leadville, Colorado, petrography of .... Mon XII, pp 315–362

Leadville, Colorado, mining district, brief description of the .... Ann 1, pp 17–22

Le Chatelier's researches on cements .... MR 1891, pp 537–538

Lepidolites of Maine, analyses and discussion of the .... Bull 42, pp 11–21

Lepidomelane from Baltimore, analysis and description of .... Bull 55, pp 14–15

Lepidomelane from Maine, analysis and description of .... Bull 42, pp 34–35; Bull 55, pp 15–16

Lesquereux (Leo), biographic sketch of ....Ann 5, pp 376-377
Lesquereux (Leo), death and biographic sketch of ....Mon XVII, pp 15-18
Lesquereux (Leo), the flora of the Dakota group...........................Mon XVII
Lettering and conventional signs adopted for the topographic maps of the United States ....Ann 6, pp xviii-xix
Levynite from Table mountain, Colorado, general description and chemical composition of...Bull 20, pp 37-38
Lherzolite from near Baltimore, Maryland, description of..........Bull 28, pp 54-59
Liebenerite from Rapid city, South Dakota, analysis of ....Bull 78, p 120
Library of the Geological Survey, contents of, June 30, 1891.........Ann 12, I, p 143
Life history of lake Lahontan....................................Mon XI, pp 238-249
Life, plant, past and present, of the earth, table and diagrams of, by types and geologic formations, with discussions thereof...........Ann 5, pp 439-452
Life, vertebrate, in America, section to illustrate..........................Mon X, p 7
Lignite from the Turtle mountains, Dakota, analysis of ....Bull 27, p 74
Lignite and fossil wood of the Potomac formation................................Bull 56
Lignites of the great Sioux reservation ....Bull 21
Lignites. See, also, Coal.
Lignitic beds of the Aleutian islands..............................Bull 84, pp 242-249
Lignitic deposits, the ....Ann 12, I, pp 415-418
Lignitic group of Alabama, Mississippi, and Kentucky..Bull 83, pp 58-61, 67-68, 72-73
Lime, phosphate of, nature and origin of deposits of ....Bull 46
Lime, statistics of..........MR 1882, pp 458-459; MR 1883-84, pp 668-670; MR 1885, pp 410-413; MR 1886, pp 565-566; MR 1887, pp 532-534; MR 1888, pp 554-557
Limestone, analysis of, from Alabama, Chewacla, Lee county.....MR 1889-90, p 377
Limestone, analysis of, from California, San Benito county........MR 1889-90, p 383
Limestone, analysis of, from Connecticut, Fairfield county........MR 1889-90, p 386
Limestone, analysis of, from Illinois, Cook county.................MR 1889-90, p 390
Limestone, analysis of, from Indiana, various localities ....Bull 42, p 140; Bull 60, pp 160-162; MR 1889-90, pp 392, 393
Limestone, analysis of, from Kansas, Cowley county and Iola.........Bull 78, p 124; MR 1889-90, p 394
Limestone, analysis of, from Massachusetts, Berkshire county.....MR 1889-90, p 403
Limestone, analysis of, from Michigan and Wisconsin, Penokee district.........Mon XIX, p 131
Limestone, analysis of, from Missouri, various localities ....Bull 78, p 125; MR 1889-90, pp 406-407
Limestone, analysis of, from New Jersey, Hunterdon county..... MR 1889-90, p 410
Limestone, analysis of, from Ohio, various localities...................Bull 55, p 80; Bull 60, pp 160-162; MR 1889-90, p 417
Limestone, analysis of, from Pennsylvania, twelve localities in.........MR 1889-90, pp 421-424
Limestone, analysis of, from Texas, El Paso county................MR 1889-90, p 432
Limestone, analysis of, from Virginia, Lexington..........................Bull 42, p 137
Limestone, analysis of, from West Virginia, below Wheeling.............Bull 9, p 17
Limestone, analysis of, from Wisconsin, Calumet and Winnebago counties.......MR 1889-90, p 439
Limestone, Carboniferous, of the Mosquito range, Colorado, description and analyses of ....Mon XII, pp 63-66, 596-598
Limestone, cherty, of the Penokee iron-bearing series, petrographical character, origin, etc., of the.............Ann 10, I, pp 365-369; Mon XIX, pp 127-142
Limestone, decay of ....Bull 52, pp 20-25
Limestone from Bowling Green, Kentucky, compared with oölite from Portland, Ireland...MR 1889-90, p 395
Limestone, production of, in the United States in 1891..........MR 1891, pp 464-468

Limestone, white, of Alabama..........Bull 83, pp 64–66
Limestones, hydraulic, analyses of, from various localities..........MR 1891, p 531
Limonite from Canaan mt., West Virginia, analysis of..........Bull 9, p 18
Lindgren (W.) and Melville (W. H.), contributions to the mineralogy of the Pacific coast..........Bull 61
Liquid and solid, the continuity of..........Bull 96, pp 71–97
Liquids, subsidence of fine solid particles in..........Bull 36; Bull 60, pp 139–145
Liquids, the compressibility of..........Bull 92
Liquids, the volume thermodynamics of..........Bull 96
Lists. See Table.
Litchfield, Maine, minerals of..........Bull 42, pp 28–38
Literature of various branches of geology, paleontology, etc. See Bibliography.
Litharge, statistics of..........MR 1891, p 598
Lithia micas, researches on the..........Bull 42, pp 11–27
Lithium, a method for the separation of sodium and potassium from, by the action of amyl alcohol on the chlorides, with some reference to a similar separation of the same from magnesium and calcium..........Bull 42, pp 73–88
Lithographic stone, analyses of..........MR 1882, p 596
Lithographic stone from foreign countries..........MR 1882, p 596
Lithographic stone, statistics of..........MR 1882, pp 595–596; MR 1883–84, pp 935–936; MR 1886, pp 690–691; MR 1889–90, pp 519–520
Lithoid tufa of Mono valley, California..........Ann 8, I, pp 311–315
Lithoidite of Obsidian cliff, Yellowstone national park..........Ann 7, p 264
Lithological characters of Azoic, Laurentian, Huronian, etc..........Bull 86, pp 167–170
Lithological characters of the strata in the Grand canyon..........Mon II, pp 209–210
Lithological geology of the quicksilver deposits of the Pacific slope..........Ann 8, II, pp 967–972
Lithological structure of Obsidian cliff, Yellowstone nat. park..........Ann 7, pp 257–260
Lithological studies in the Archean of the northwestern states..........Ann 5, pp 209–242
Lithology and stratigraphy of the Newark system..........Bull 85, pp 32–44
Lithology, importance of, to theory of ore-deposits..........Mon III, p 32
Lithology of the Keweenaw series..........Ann 3, pp 101–115; Mon V, pp 34–133
Lithology of the Pacific slope..........Mon XIII, pp 56–175, 453–460
Lithology of the Washoe district, Nevada..........Mon III, pp 32–155, 369–376
Lithology, use of, in establishing correlations..........Ann 7, pp 378–390
Lithology, use of, in marking off the grander groups of strata..........Ann 7, p 377
Lithology. See, also, Petrography.
Lithophysæ in obsidian of Yellowstone national park..........Ann 7, pp 265–272
Lithophysæ, origin of..........Ann 7, pp 279–290
Littoral erosion, transportation, and deposition..........Ann 5, pp 80–99; Mon I, pp 29–60; Mon XI, pp 87–99
Lode, horse, etc., discussion of the meaning of..........Mon VII, pp 115–117
Loess as a brick material..........MR 1891, p 496
Loess, chemical and mineralogical constitution of..........Ann 6, pp 281–283
Loess, especially that of the Mississippi valley..........Ann 6, pp 278–307
Loess in Kansas..........Bull 57, pp 41–42
Loess in northeastern Iowa and contiguous territory..........Ann 11, I, pp 435–471
Loess of the lower Mississippi..........Ann 12, I, pp 392–393
Loess, origin, features, composition, and distribution of the..........Ann 6, pp 286–307; Ann 11, I, pp 291–303
Loess, the, and its relation to the glacial drift..........Bull 58, pp 101–104
Loess and clays, analyses of..........Bull 42, pp 142–144
Loess. See, also, Glacial.
Löllingite of Gunnison county, Colorado, occurrence, description, and chemical composition of..........Bull 20, pp 89–93

Lone mountain limestone at Eureka, Nevada ....Mon xx, pp 57–62

Long valley reservoir and irrigation-canal lines, Nev..Ann 11, II, pp 177–178, 179, 182

Longitudes and latitudes of certain points in Missouri, Kansas, and N. M....Bull 49

Lord (E.), Comstock mining and miners..Mon IV

Lord (E.), report of Tenth Census work ....Ann 1, pp 48–50

Lord (J. S.), Illinois coal...MR 1888, pp 242–256

Louisiana, altitudes in.......................................Bull 5, p 125; Bull 76

Louisiana, boundary lines of, and admission of state..........Bull 13, pp 30, 104–105

Louisiana, brick industry of.................MR 1887, pp 536, 538; MR 1888, p 560

Louisiana, clay production of ....MR 1891, p 507

Louisiana, Eocene deposits of...................................Bull 83, pp 75–76, 84

Louisiana, fossils from..Ann 8, II, pp 880–881

Louisiana, geologic investigations in..............Ann 7, pp 103–104; Ann 12, I, p 75

Louisiana, geological maps of, listed.....................................Bull 7, p 140

Louisiana, iron-ore deposits of....................................MR 1887, pp 50–51

Louisiana, iron ores from, analyses of..............................Bull 42, pp 144–145

Louisiana; iron regions of northern La. and eastern Texas. See p 323 of this Bull.

Louisiana, marble from, analysis of....................................Bull 60, p 160

Louisiana, mineral springs of.......................................Bull 32, pp 123–124

Louisiana, minerals of, the useful..............MR 1882, pp 686–687; MR 1887, p 736

Louisiana, Neocene beds of...Bull 84, pp 167–170

Louisiana, purchase of, from France.......................Bull 13, pp 19–21, 30–31

Louisiana, salines of...MR 1882, pp 554–565

Louisiana, salt formations and statistics of..MR 1882, pp 532–534, 554–565; MR 1883–84, pp 827, 841–842; MR 1885, pp 474, 480; MR 1886, pp 628, 636; MR 1887, pp 611, 620–621; MR 1888, pp 597–598, 604; MR 1889–90, pp 482, 488; MR 1891, p 577

Louisiana, sulphur deposits in ....MR 1885, p 496

Louisiana, topographic work in ....Ann 11, I, p 40; Ann 12, I, pp 24, 28, 31

Loup fork group of S. Dak., Neb., and Colo.....Bull 84, pp 292–293, 296–298, 304–305

Lustre exhibited by sanidine in certain rhyolites ....Bull 20, pp 75–80

Lustre-mottling structure in gabbro (see, also, Poicilitic) ....Mon v, p 42

Lycopodineæ from the Carboniferous basins of southwestern Mo..Bull 98 pp 103–104

McChesney (J. D.), report of office work for 1879–80...................Ann 1, pp 9–13

McChesney (J. D.), disbursements made during 1886–87..........Ann 8, I, pp 210–257

McChesney (J. D.), disbursements made during 1887–88.............Ann 9, pp 152–199

McChesney (J. D.), disbursements made during 1888–89.........Ann 10, I, pp 199–252

McChesney (J. D.), disbursements made during 1889–90.........Ann 11, I, pp 140–185

McChesney (J. D.), disbursements made during 1890–91.........Ann 12, I, pp 146–210

McGee (W. J.), administrative report for 1883–84.....................Ann 5, pp 34–41

McGee (W. J.), administrative report for 1884–85.....................Ann 6, pp 25–32

McGee (W. J.), administrative report for 1885–86...................Ann 7, pp 104–111

McGee (W. J.), administrative report for 1886–87................Ann 8, I, pp 166–173

McGee (W. J.), administrative report for 1887–88...................Ann 9, pp 102–110

McGee (W. J.), administrative report for 1888–89...............Ann 10, I, pp 148–158

McGee (W. J.), administrative report for 1889–90..................Ann 11, I, pp 65–70

McGee (W. J.), administrative report for 1890–91..................Ann 12, I, pp 70–77

McGee (W. J.), geology of the head of Chesapeake bay...........Ann 7, pp 537–646

McGee (W. J.), investigations relating to the Charleston earthquake.........Ann 9, pp 209, 298–299

McGee (W. J.), map showing the areal geology of the United States (preliminary compilation)...............Ann 5, cover pocket, and pp xxviii–xxx, 36–38

McGee (W. J.), rock gas and related bitumens.................Ann 11, I, pp 589–616

McGee (W. J.), the Lafayette formation.........................Ann 12, I, pp 347–521

McGee (W. J.), the Pleistocene history of northeastern Iowa...Ann 11, I, pp 189–577

McKinley (C.), account of the Charleston earthquake ....Ann 9, pp 212–225

Macrostructural metamorphism of massive rocks..........Bull 62, pp 43–46, 201–204

Madeira, fossil plants of, literature of the..........Ann 8, II, p 818

Madison river basin, hydrography of the..........Ann 11, II, pp 39–40, 94

Magmas, molten, considered as solutions..........Bull 66, pp 26–29

Magmas of eruption, two, in the Eureka district, Nevada..........Mon xx, pp 253–257

Magnesia, analyses of..........MR 1886, pp 695, 697

Magnesium and calcium, separation of sodium and potassium from, by the action of amyl alcohol on the chlorides..........Bull 42, pp 73–88

Magnesium, statistics of..........MR 1886, pp 694–698

Magnetic and electrical properties of the iron carburets..........Bull 14

Magnetic iron ore from near Bozeman, Montana, analysis of..........Bull 9, p 17

Magnetite and hematite, occurrence of, in the Penokee iron-bearing rocks..........Ann 10, I, p 391

Magnetization, effect of, on the viscosity and the rigidity of iron and of steel..Bull 73, pp 105–119

Magnetization, influence of hardness on..........Bull 14, pp 111–150

Magnetization, thermoelectric effect of..........Bull 14, pp 104–110

Mailloux (C. O.), electrolysis in the metallurgy of copper, lead, zinc, and other metals..........MR 1882, pp 627–658

Maine; allanite from Topsham, description and analysis of..........Bull 9, pp 10–11

Maine, altitudes in..........Bull 5, pp 126–128; Bull 76

Maine, boundary lines of..........Bull 13, pp 32–40

Maine, brick industry of..........MR 1887, p 536; MR 1888, pp 560, 566

Maine, building stone from, statistics of......MR 1882, pp 451, 452; MR 1887, p 513; MR 1888, pp 536, 538; MR 1889–90, pp 373, 396–398; MR 1891, pp 457, 458, 464, 466

Maine, Cambrian rocks of..........Bull 81, pp 68–69, 267

Maine; cimolite from Norway, analysis of..........Bull 9, p 12

Maine, copper from, statistics of..........Ann 2, p xxix; MR 1882, pp 216, 230; MR 1883–84, p 329; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83–84

Maine; damourite from Stoneham, description and analysis of..........Bull 9, p 11

Maine, fossils from..........Ann 8, II, p 849

Maine, geologic and paleontologic investigations in..........Ann 6, pp 19, 36; Ann 7, pp 62, 82, 157; Ann 8, I, pp 126, 143; Ann 9, pp 71, 77; Ann 10, I, p 160; Ann 12, I, p 66

Maine, geological maps of, listed..........Bull 7, pp 55, 56, 57

Maine, gold and silver from, statistics of..........Ann 2, p 385; MR 1882, pp 172, 176, 177, 178; MR 1883–84, p 312; MR 1886, pp 104, 105; MR 1887, p 58; MR 1888, p 36

Maine, granite production of..........MR 1891, pp 457, 458

Maine, iron and steel from, statistics of..........Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 131, 133, 134, 135, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184, 186; MR 1886, pp 17, 41–42; MR 1887, pp 11, 42; MR 1888, p 14; MR 1889–90, pp 10, 17; MR 1891, pp 27, 61

Maine, lepidolites of..........Bull 42, pp 11–21

Maine, lime production of..........MR 1887, p 533; MR 1888, p 555

Maine; Litchfield, the minerals of..........Bull 42, p 28

Maine, mineral springs of..........Bull 32, pp 13–16; MR 1883–84, p 982; MR 1885, p 538; MR 1886, p 716; MR 1887, p 684; MR 1888, p 627; MR 1889–90, p 528; MR 1891, pp 603, 605

Maine, minerals of, the useful..........MR 1882, pp 687–690; MR 1887, pp 736–739

Maine; mount Desert, geology of the island of..........Ann 8, II, pp 987–1061

Maine; petalite from Peru, description and analysis of..........Bull 60, p 129

Maine, precious stones mined for in..........MR 1882, p 483; MR 1883–84, pp 723–724, 744; MR 1885, p 437; MR 1886, p 595

Maine, rocks of..........Bull 80, pp 240, 247, 256

Maine; sea-coast swamps of eastern United States..........Ann 6, pp 353–398

Maine, slate production of..........MR 1891, pp 472, 473

Maine, tin ore in..........MR 1883-84, pp 598-599

Maine; topaz from Stoneham, analysis of..........Bull 27, pp 9-15

Maine, topographic work in......Ann 10, I, pp 85, 88; Ann 11, I, p 35; Ann 12, I, p 25

Maine; water from Paris, analysis of..........Bull 55, p 91

Malheur river basin, Oregon, hydrography of..........Ann 11, II, pp 87-88, 106

Mammals, fossil, extinction of large..........Mon X, pp 189-190

Mammals, gigantic, an extinct order of (Dinocerata).....Ann 5, pp 243-302; Mon X

Mammals of the Eocene in the Rocky mountain region..........Ann 5, pp 249-254

Mammoth hot springs. Yellowstone national park, analysis of water from..Ann 9, p 639

Mammoth hot springs, Yellowstone national park, geological relations, deposits, etc., of..........Ann 9, pp 628-650

Mammoth hot springs. See, also, Yellowstone national park.

Man and the soil, action and reaction of..........Ann 12, I, pp 329-345

Man; human remains in the auriferous gravels of California.....Bull 84, pp 221-222

Man, influence of physiography on..........Ann 12, I, p 357

Man, interglacial, in Ohio..........Bull 58, pp 105-108

Manganese, foreign sources of..........MR 1883-84, pp 554-555; MR 1885, pp 350-356; MR 1886, pp 198-207; MR 1887, pp 153-161; MR 1888, pp 133-143; MR 1889-90, p 130; MR 1891, pp 138-146

Manganese in steel..........Bull 25, p 13

Manganese in the manufacture of iron and steel..........MR 1886, pp 209-213

Manganese silver ore, analyses of..........MR 1883-84, pp 330-331

Manganese, statistics of..........MR 1882, pp 424-427; MR 1883-84, pp 550-566; MR 1885, pp 303-356; MR 1886, pp 180-213; MR 1887, pp 144-167; MR 1888, pp 123-143; MR 1889-90, pp 127-136; MR 1891, pp 126-146

Manganese and iron, ores of, analyses of..........Bull 55, pp 85-87; Bull 60, pp 164-169; Bull 64, pp 51-53; Bull 78, pp 127-128; MR 1891, pp 134, 135, 137, 140, 144

Manganiferous iron ore of lake Superior, analyses of..........MR 1891, pp 128-129

Mangrove swamps..........Ann 10, I, pp 291-295

Manhattan group of rocks in New York..........Bull 86, p 397

Manigault (G. E.), account of the Charleston earthquake..........Ann 9, pp 226-241

Manitounuck group of rocks of Hudson bay..........Bull 86, pp 212-213

Manti beds..........Bull 83, p 141

Map, geologic, of the United States, plan for the..........Ann 8, I, pp 74-76

Map notation and geologic nomenclature, conference of geologists and lithologists on, in January, 1889..........Ann 10, I, pp 56-67

Map, the topographic, of the United States, plan and description of the......Ann 4, pp xiii-xxiv; Ann 6, pp xvi-xix; Ann 7, pp 3-8

Map work in the United States done by national and state organizations and by corporate and private enterprise, a sketch of the..........Ann 4, pp xiv-xx

Map work, topographic, reports on..........Ann 3, pp xv-xvi; Ann 4, pp xiii-xxiv, 3-16; Ann 5, pp xvii-xx, 3-14; Ann 6, pp xv-xix, 3-17; Ann 7, pp 3-8, 45-60; Ann 8, I, pp 70-74, 97-122; Ann 9, pp 3-7, 49-69; Ann 10, I, pp 5-9, 83-108

Maps; atlas sheets of the United States prepared by the Geological Survey and engraved to May 20, 1893, list of, by states. See pp 307-320 of this bulletin.

Maps, formulas and tables to facilitate the construction and use of..........Bull 50

Maps; geologic folios and sheets. See pp 305-306 of this bulletin.

Maps, geological, of America, a catalogue of the..........Bull 7

Maps, geological (arranged geographically):

Map showing distribution of quicksilver deposits throughout the world....Ann 8, II, pp 968-969

Map, outline, of Europe, showing the comparative thickness and depth of deposition of the Cambrian and lower Silurian rocks in different areas...Ann 8, II, pp 566-567

Maps, geological (arranged geographically)—continued.
Map of European Russia, showing the phosphate beds..............Bull 46, p 112
Map, hypothetical, of the North American continent at the beginning of lower Cambrian time................Ann 12, I, pp 546–547; Bull 81, pp 368–369
Map, hypothetical, of the North American continent at the beginning of lower Silurian (Ordovician) time ....Ann 12, I, pp 566–567
Map, outline, of North America, with sections illustrating the comparative thickness of the Cambrian in different provinces.....Ann 8, II, pp 558–559
Map showing the distribution by geological provinces of the Cambrian strata as shown by surface outcrops in North America ....Ann 10, I, pp 510–511; Bull 81, pp 358–359
Map to illustrate the relative amount of sedimentation within the typical geologic provinces of North America during Cambrian time..........Ann 12, I, pp 532–533; Bull 81, pp 364–365
Map showing the distribution of Cretaceous formations of North America ....Bull 82, pp 268–269
Map showing the outlines of the known Cretaceous regions of North America...Bull 82, pp 72–73
Map, geological, of northern Canada.........................Bull 86, pp 210–211
Map, geological, of a portion of southern Canada...............Bull 86, pp 24–25
Map, geological, of New Brunswick, Nova Scotia, and part of Quebec.........Bull 86, pp 224–225
Map, geological, of Newfoundland ....Bull 86, pp 248–249
Map of the Acadian area of the Newark system.................Bull 85, pp 18–19
Map of the United States exhibiting the present status of knowledge relating to the areal distribution of geologic groups (preliminary compilation)........................Ann 5, cover pocket and pp xxviii–xxx, 36–38
Map showing the distribution of the Eocene in the United States.......Bull 83, pp 146–147
Map showing the known distribution of the Neocene formations in the United States ....Bull 84, pp 178–179
Map showing geographic distribution of fossil plants in the United States...Ann 8, II, pp 818–849
Map, general, of the terminal moraine of the second glacial epoch.........Ann 3, pp 314–315
Map of a portion of the terminal moraine of the second glacial epoch....Ann 3, pp 322–323, 346–347, 382–383
Map showing areas occupied by the Newark system ....Bull 85, pp 2–3
Map showing areal distribution of Columbia and Lafayette formations.....Ann 12, I, pocket
Map of the glacial striæ of eastern United States...............Ann 7, pp 154–155
Map, general, of the drift of northeastern United States, showing the relations of the driftless area.....................................Ann 6, pp 204–205
Map, geological, of the northeastern states.................Bull 86, pp 348–349
Map showing glaciated region and Pleistocene water bodies of northern and eastern half of United States.........................Ann 11, I, pp 188–189
Map, geological, of mount Desert island, Maine...........Ann 8, II, pp 1060–1061
Map showing the Quaternary deposits of mount Desert island, Maine ....Ann 8, II, pp 994–995
Map, geological, of cape Ann, Massachusetts, showing distribution of dikes, etc ....Ann 9, pp 610–611
Map, geological, of cape Ann, Massachusetts, showing distribution of glacial scratches, etc...Ann 9, pp 606–607
Map, geological, of cape Ann, Massachusetts, showing superficial deposits ....Ann 9, pp 608–609
Map, geological, of Martha's vineyard, showing substructure..Ann 7, pp 308–309

Maps, geological (arranged geographically)—continued.

Map of Martha's vineyard, showing the surface geology....... Ann 7, pp 308-309
Map of the island of Nantucket, showing the distribution of glacial and post-glacial deposits....... Bull 53, pp 2-3
Map of Connecticut valley and Southbury areas of the Newark system..... Bull 85, pp 20-21
Map and section of Southbury area, Connecticut valley....... Bull 85, p 82
Map, geological, of Connecticut, Percival's (1842), modification of a portion of....... Ann 7, pp 462-463
Map of Rockland county, N. Y., showing geologic formations....... Bull 67, p 40
Map of the New York-Virginia and other Newark areas....... Bull 85, pp 20-21
Map, geological, of the greater part of New Jersey....... Mon IX, pocket
Map and sections showing relations of Granton trap to Palisade trap, New Jersey....... Bull 67, p 54
Map of a portion of northeastern New Jersey, showing the relations of the Watchung traps....... Bull 67, pp 16-17
Map of Flemington, New Jersey, and vicinity, showing the extent and position of the three trap masses....... Bull 67, p 66
Map of Rocky hill, Ten mile run mountain, Lawrence brook trap and vicinity, New Jersey....... Bull 67, p 60
Map of the New Germantown trap region, New Jersey....... Bull 67, p 36
Map of the region adjacent to the New Vernon trap, Long hill, and the inner side of the terminal hook of the second Watchung mountain, New Jersey....... Bull 67, pp 34-35
Map of the region near Arlington and the Schuyler copper mine, north of Newark, New Jersey, showing traps....... Bull 67, p 57
Map showing the relations of the Palisade trap north and northeast of Hoboken, New Jersey....... Bull 67, p 45
Map, stereogrammic, and sections of Cushetunk and Round mountains and vicinity, New Jersey, showing trap....... Bull 67, p 63
Map, stereogrammic, and sections of Snake hill, New Jersey....... Bull 67, p 55
Map, geological, of part of northern New Jersey and adjacent portions of New York and Pennsylvania....... Bull 67, pp 2-3; Bull 85, pp 24-25
Map of the Delaware river region, New Jersey and Pennsylvania, showing trap, etc....... Bull 67, pp 62-63
Map of gabbro area in Delaware....... Bull 59, pp 6-7
Map, geological, of the Baltimore gabbro-area....... Bull 28, pp 73-74
Map of the head of Chesapeake bay, showing the distribution of the Columbia formation....... Ann 7, pp 552-553
Map of the Richmond area of the Newark system....... Bull 85, pp 22-23
Map of the Newark areas in southwestern Va. and N. C....... Bull 85, pp 22-23
Map, geological, of the southeastern states,....... Bull 86, pp 416-417
Map of a portion of North Carolina, showing phosphate beds... Bull 46, pp 70-71
Map of a portion of South Carolina, showing phosphate beds... Bull 46, pp 60-61
Map, geologic, of Florida....... Bull 84, pp 156-157
Map of Alabama, showing the distribution of Cenozoic and Mesozoic strata.. Bull 43, pp 134-135
Map of Alabama, showing the distribution of Eocene strata.... Bull 83, pp 60-61
Map showing the general distribution of the upper and middle Carboniferous formations in the bituminous coal regions of Pennsylvania, West Virginia, and Ohio....... Bull 65, pp 2-3
Map of Hamilton county, Ohio, showing situation of glacial terrace in which paleolith was formed....... Bull 58, p 106
Map showing glacial boundary in Ohio....... Bull 58, p 46
Map, geological, of portions of Ohio and Indiana....... Ann 8, II, pp 520-521
Map, geologic, of Indiana, showing gas and oil fields...... Ann 11, I, pp 620-621

Maps, geological (arranged geographically)—continued.
Map showing approximate topography of the Trenton limestone in western Ohio and eastern Indiana .... Ann 8, II, pp 548–549
Map, hypsographic, of the Trenton formation in Indiana .. Ann 11, I, pp 648–649
Map of southern Indiana, showing glacial boundary .... Bull 58, p 65
Map of southern Illinois, showing glacial boundary .... Bull 58, pp 70–71
Map, preliminary geological, of the Northwest .... Ann 5, pp 180–181; Mon XIX, pp XX–1
Map, preliminary geological, of the Northwest (smaller area) .... Ann 10, I, pp 348, 349
Map, geological, of the original Huronian rocks .... Bull 86, pp 34–35
Map, geological, of the lake Superior basin .... Ann 3, pp 92–93; Mon V, pp 24–25; Bull 86, pp 52–53
Map of the lake Superior basin, designed to show the structure and extent of the Keweenawan trough .... Ann 3, pp 172–173; Mon V, pp 410–411
Map, geological, of the northwestern coast of lake Superior .... Ann 3, pp 140–141; Mon V, pp 262–263
Map, geological, of Keweenaw point, Michigan .... Ann 3, pp 116–117; Mon V, pp 162–163
Map, outline geological, of the Marquette region .... Bull 62, pp 14–15
Map, geological, of the Porcupine mountains, Michigan .... Ann 3, pp 132–133; Mon V, pp 208–209
Map, geological, Brooks and Pumpelly's, of the upper peninsula of Michigan, reproduction of a portion of .... Mon XIX, pp 31–32
Map, geological, of the region between the Ontonagon river, Michigan, and Numakagon lake, Wisconsin .... Ann 3, pp 138–139; Mon V, pp 224–225
Map, diagrammatic, of drift currents adjacent to the driftless area .... Ann 6, pp 312–313
Map, geological, of central Wisconsin, designed to indicate the character of the ante-Potsdam land surface .... Ann 7, pp 404–405
Map, geological, of the driftless region of the upper Mississippi and environs .... Ann 6, pp 220–221
Map, Quaternary, of the driftless area of the upper Mississippi and environs .... Ann 6, pp 258–259
Map of the Green bay loop (Wisconsin) of the terminal moraine of the second glacial epoch .... Ann 3, pp 316–317
Map showing positions of exposures of Keweenawan rocks in the upper St. Croix valley, Wisconsin .... Mon V, pp 246–247
Map showing glacial flood plain of the Chippewa river .... Ann 6, pp 308–309
Map, general geological, of the Penokee region .... Ann 10, I, pp 350–351; Mon XIX, pp 2–3
Map, geological, of the Penokee-Gogebic iron region .... Ann 7, pp 422–423
Map of exposures at West branch of Montreal river, Wis... Mon XIX, pp 178–179
Map, geological, Whittlesey's, of the Penokee range, reproduction of .... Mon XIX, pp 20–21
Map showing detailed geology in the vicinity of Penokee gap .... Mon XIX, pp 520–521
Map, geological, Barnes and Whitney's, of region between Agogebic lake and Montreal river, Wis., reproduction of .... Mon XIX, pp 13–14
Map, geological, of Gunflint lake and vicinity, Animikie series .... Mon XIX, pp 522–523
Map of exposures at Potato river, Wisconsin .... Mon XIX, pp 172–173
Map and section showing position of rock exposures at Tyler's fork, Wis... Mon XIX, pp 177–178
Map, outline geological, of the Menominee iron region .... Bull 62, pp 24–25
Map, geological, of Gunflint lake and vicinity, Minnesota... Ann 10, I, pp 508–509

Maps, geological (arranged geographically)—continued.

Map, geological, of northeastern Minnesota .... Ann 7, pp 418–419
Map of the upper beaches and deltas of the glacial lake Agassiz .. Bull 39, pp 2–3
Map showing position of the exposures of Keweenawan rocks and Potsdam sandstone along the lower portions of Snake and Kettle rivers, Minnesota .... Mon V, pp 240–241
Map, geological, of isle Royal and neighboring mainland .... Ann 3, pp 156–157; Mon V, pp 328–329
Map showing regular deformations of northeastern Iowa and contiguous territory .... Ann 11, I, pp 346–347
Map of topographic areas of northeastern Iowa, showing drift, loess, and other topography .... Ann 11, I, pp 360–361
Map showing representative paha in northeastern Iowa .... Ann 11, I, pp 404–405
Map, tectonic, of northeastern Iowa, showing distribution of ice and water in glacial times .... Ann 11, I, pp 564–565, 566–567, 568–569, 570–571
Map showing principal lakes and rivers of northeastern Iowa during the second ice invasion .... Ann 11, I, pp 576–577
Map showing primeval forests and swamps of northeast Iowa .. Ann 11, I, pocket
Map showing indurated formations of northeastern Iowa ...... Ann 11, I, pocket
Map showing Pleistocene deposits of northeastern Iowa .... Ann 11, I, pocket
Map, geological, of part of the great Sioux reservation, Dakota ... Bull 21, at end
Map, geological, of southwest Kansas .... Bull 57, pp 2–3
Map, geological, of Leadville and vicinity, Lake county, Colorado .... Ann 2, pp 240–241; Mon XII, atlas sheets xiii, xiv
Map, geological, of Mosquito range .... Mon XII, atlas sheets vi, vii
Map, geological, of a portion of northwestern Colorado and adjacent parts of Utah and Wyoming .... Ann 9, pp 684–685
Map, geological, of the region of Sepulchre mountain, Yellowstone national park .... Ann 12, I, pp 664–665
Map, geological, of portions of Colorado and New Mexico .... Bull 86, pp 308–309
Map, geological, of portions of Montana, Idaho, Wyoming, and Dakota ... Bull 86, pp 258–259
Map, geological, of northwestern New Mexico .... Ann 6, pp 128–129
Map, geological, of a portion of the Old river bed, Utah .... Mon I, pp 194–195
Map of a volcanic district near Fillmore, Utah .... Mon I, 320–321
Map of the mouths of Little and Dry Cottonwood canyons, Utah, showing glacial moraines and faults .... Mon I, pp 346–347
Map of the Old river bed, showing former connection of Great salt lake with Sevier lake .... Mon I, pp 182–183
Map of lake Bonneville, showing its extent at the date of the Provo shoreline .... Mon I, pp 128–129
Map of lake Bonneville, showing lines of recent faulting ...... Mon I, pp 352–353
Map of lake Bonneville, showing local variations of the vertical interval between the Bonneville and Provo shorelines .... Mon I, pp 372–373
Map of lake Bonneville, showing the deformation of the Bonneville shoreline .... Mon I, pp 368–369
Map of lake Bonneville, showing the deformation of the Provo shoreline and the position of Great salt lake on its plain .... Mon I, pp 372–373
Map of lake Bonneville, showing the distribution of basalt .. Mon I, pp 334–335
Map of lake Bonneville, showing the glaciated districts of the Bonneville basin .... Mon I, pp 374–375
Map of lake Bonneville, showing the present hydrographic divisions of the Bonneville basin .... Mon I, pp 122–123
Map of the outlet of lake Bonneville in Idaho .... Mon I, pp 174–175
Map of the Great basin and its Quaternary lakes .... Ann 8, I, pp 268–269; Mon I, pp 6–7; Mon XI, pp xiv–1

;eological (arranged geographically)—continued.
p of the northwestern part of the Great basin, showing fault lines,
tc ....Ann 4, pp 442–443
p of the northwestern part of the Great basin, showing Quaternary
ıkes, etc ....Ann 4, pp 438–439
p, geological, of Utah and Nevada.......................Bull 86, pp 286–287
p of Carson desert, Nevada, showing lake Lahontan beach...Mon xi, pp 44–45
p of lake Lahontan, a Quaternary lake of northwestern Nevada ......Ann 3,
pp 204–205; Mon xi, pocket
ı of lake Lahontan, showing water area and boundary of hydro-
raphic basin ....Mon xi, pp 30–31
ı showing depth of lake Lahontan at highest water stage ..Mon xi, pp 32–33
ı showing post-Quaternary fault lines in the Lahontan basin...........Mon
xi, pp 274–275
ı showing pre-Quaternary fault lines in the Lahontan basin..Mon xi, pp 28–29
ı showing water surface of lake Lahontan at the thinolite stage.......Mon
xi, pp 192–193
ı of Walker lake, Nevada, showing Lahontan beach, etc ...Mon xi, pp 70–71
ı showing the Mono basin in Quaternary time...........Ann 8, i, pp 328–329
, geological, of the western part of the Plateau province................Mon
ii, atlas sheet ii
showing the distribution of volcanic areas around the borders of the
ateau country...Ann 6, pp 118–119
, sketch, of the western part of the Plateau province, showing the faults
the Grand canyon district and high plateaus...........Mon ii, atlas sheet iii
, sketch, showing the distribution of the strata and the eruptive rocks
the western part of the Plateau province....................Ann 2, pocket
, geological, of the Colorado plateau and San Francisco moun-
ns..Mon ii, atlas sheet xxiii
geological, of Arizona and part of New Mexico ....Bull 86, pp 326–327
of the Uinkaret plateau........................Mon ii, atlas sheets vii, viii
geological, of the Grand canyon in the Kaibab plateau............Mon ii,
atlas sheet xiii
geological, of the Mesozoic terraces of the Grand canyon district and
southern portions of the high plateaus..............Mon ii, atlas sheet xxi
geological, of the southern part of the Kaibab plateau.............Mon ii,
atlas sheets xi, xii, xiv
geological, showing the Kanab, Kaibab, Paria, and Marble canyon
tforms..Mon ii, atlas sheet xxii
geological, showing the southwestern portion of the Mesozoic ter-
es and the vicinity of the Hurricane fault...........Mon ii, atlas sheet xx
of the Grand canyon platform and the surrounding Mesozoic forma-
ıs...Mon ii, pp 28–29
geological, of the Eureka district, Nevada.............Ann 3, pp 240–241;
Mon xx, atlas sheet iv
geological, of Ruby hill, Eureka mining district, Nevada ....Ann 2,
pp 22–23; Mon vii, pp 4–5; Mon xx, pp 116–117
geological, of the Steamboat springs district, Nevada............Mon xiii,
atlas sheet xiv
geological, of the Washoe district, Nevada ....Mon iii, atlas sheet iv
geological, of Virginia, Nevada, and immediate vicinity...Ann 2, pp 292–293
geological, of a cinder-cone region in northern California..Bull 79, pp 22–23
geological, of Lassen peak district, California.........Ann 8, i, pp 406–407
geological, of the Clear lake district, Cal........Mon xiii, atlas sheet iii
geological, of the Knoxville district, Cal...........Mon xiii, atlas sheet v
geological, of the New Almaden district, Cal.......Mon xiii, atlas sheet vii

Maps, geological (arranged geographically)—continued.
  Map, geological, of the New Idria district, Cal..........Mon XIII, atlas sheet VI
  Map, geological, of the Sulphur bank district, Cal......Mon XIII, atlas sheet IV
  Map showing morainal embankments of Parker and Bloody canyons, California..........Ann 8, I, pp 340–341
  Map showing the rock formations in the neighborhood of the Great western quicksilver mine, California..........Mon XIII, pp 358–359
  Map showing the rock formations in the neighborhood of the Oathill quicksilver mine, California..........Mon XIII, pp 354–355
  Map, sketch, showing distribution of quicksilver mines in California..Ann 8, II, pp 966–967
  Map of eastern Washington, showing geologic formations.......Bull 40, at end
  Map showing the known distribution of the Neocene formations in Alaska..........Bull 84, pp 268–269
Marble from Georgia, Pickens county, analysis of..........MR 1889–90, p 387
Marble from Louisiana, analysis of..........Bull 60, p 160
Marble, statistics of..........MR 1882, pp 450–457; MR 1883–84, pp 665–667; MR 1885, pp 398, 402–404; MR 1886, pp 539, 541–546, 554–556; MR 1887, pp 517–520, 525–527; MR 1888, pp 541–543, 550–551; MR 1889–90, pp 375–376; MR 1891, pp 456, 468–471
Marble canyon, Grand canyon district, description of the ..Ann 2, p 71; Mon II, p 10
Marcou (J.) and Marcou (J. B.), catalogue of geological maps of America.....Bull 7
Margarite from near Gainesville, Georgia, description and analysis of....Bull 9, p 11
Marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America..........Bull 18
Marine marshes..........Ann 12, I, pp 317–320
Marine Mollusca..........Bull 24
Marl, Arcadia, of Florida..........Bull 84, pp 131–132
Marl from Pyramid lake, Nevada, analysis of..........Bull 9, p 14
Marl from Trego county, Kansas, analysis of..........Bull 27, p 71
Marl of lake Bonneville, composition of..........Mon I, pp 200–203
Marl, white, of lake Lahontan..........Mon XI, pp 149–153
Marls, analyses of..........MR 1882, pp 525–526; MR 1886, p 620
Marls, greensand, and Raritan clays of New Jersey, Brachiopoda and Lamellibranchiata of the..........Mon IX
Marls, greensand, and Raritan clays of New Jersey, Gasteropoda and Cephalopoda of the..........Mon XVIII
Marls, greensand, of N. J., paleontological equivalents of the...Mon XVIII, pp 31, 32
Marls, statistics of..........MR 1882, pp 522–526; MR 1883–84, p 808; MR 1885, p 464; MR 1886, pp 619–620; MR 1887, p 592; MR 1888, pp 595–596; MR 1889–90, p 454; MR 1891, p 4
Marquette and Menominee regions of Michigan, the greenstone-schist areas of the..........Bull 62
Marquette series of lake Superior..........Mon XIX, pp 470–472; Bull 86, pp 189–190
Marsh (O. C.), administrative report for 1882–83..........Ann 4, pp 41–42
Marsh (O. C.), administrative report for 1883–84..........Ann 5, pp 49–50
Marsh (O. C.), administrative report for 1884–85..........Ann 6, pp 71–72
Marsh (O. C.), administrative report for 1885–86..........Ann 7, pp 111–113
Marsh (O. C.), administrative report for 1886–87..........Ann 8, I, pp 173–174
Marsh (O. C.), administrative report for 1887–88..........Ann 9, pp 114–115
Marsh (O. C.), administrative report for 1888–89..........Ann 10, I, pp 158–159
Marsh (O. C.), administrative report for 1889–90..........Ann 11, I, pp 101–102
Marsh (O. C.), administrative report for 1890–91..........Ann 12, I, pp 118–119
Marsh (O. C.), birds with teeth..........Ann 3, pp 45–88
Marsh (O. C.), Dinocerata, a monograph of an extinct order of gigantic mammals..........Mon X

Marsh (O. C.), gigantic mammals of the Dinocerata................Ann 5, pp 243–302

Marshall (W. L.), hypsometric method of...........................Ann 2, pp 549–550

Marshes, marine, formation and fertility of........................Ann 12, I, 317–320

Marshes, salt, catalogue of the larger, of New Eng. and Long id..Ann 6, pp 390–398

Marshes, salt-water, process of development of.....................Ann 6, pp 363–373

Marshes. See, also, Swamps.

Martha's vineyard, classification of the strata of..................Bull 84, pp 35–38

Martha's vineyard, Cretaceous deposits of............................Bull 82, pp 86–87

Martha's vineyard, geology of..Ann 7, pp 297–360

Martha's vineyard, phosphates of...Bull 46, p 78

Martha's vineyard, surveys of, by H. L. Whiting..................Ann 7, pp 361–363

Martyn (W.), pyrites, statistics of..............................MR 1883–84, pp 877–905

Maryland, altitudes in ....Bull 5, pp 129–132; Bull 76

Maryland, boundary lines of...Bull 13, pp 82–85

Maryland, brick industry of..............MR 1887, pp 536, 538; MR 1888, pp 560, 566

Maryland, building stone from, statistics of....................MR 1882, pp 451–452; MR 1887, p 518; MR 1888, pp 536, 538, 541; MR 1889–90, pp 373, 398–400; MR 1891, pp 457, 459, 461, 462, 464, 466

Maryland, Cambrian rocks of.................................Bull 81, pp 133, 289–290

Maryland, chromium industry of..MR 1882, p 428; MR 1883–84, p 567; MR 1885, p 358

Maryland, clay production of...MR 1891, p 504

Maryland, coal area and statistics of ....Ann 2, p xxviii; MR 1882, pp 58–60; MR 1883–84, pp 12, 49–50; MR 1885, pp 11, 33–34; MR 1886, pp 225, 230, 272–279; MR 1887, pp 169, 171, 263–270; MR 1888, pp 169, 171, 280–283; MR 1889–90, pp 146, 221–225; MR 1891, pp 180, 255–259

Maryland, Cretaceous deposits of..Bull 82, pp 88–89

Maryland; dolomite marble from Cockeysville, analysis of............Bull 60, p 159

Maryland, Eocene formations in..............................Bull 83, pp 43–45, 80, 86

Maryland, fossils from ....Ann 4, pp 309–310, 314; Ann 8, II, pp 870–872

Maryland; gabbros and associated hornblende rocks occurring in the neighborhood of Baltimore..Bull 28

Maryland; gahnite from Montgomery county, analysis of....................Bull 9, p 9

Maryland, geologic and paleontologic investigations in........Ann 7, pp 67, 110, 123; Ann 8, I, pp 167, 184, 185, 188; Ann 9, pp 115, 122; Ann 10, pp 152–154; Ann 11, I, pp 66, 68, 116; Ann 12, I, pp 72, 76, 117, 120, 122

Maryland; geology of the head of Chesapeake bay.................Ann 7, pp 537–646

Maryland, granite production of.....................................MR 1891, pp 457, 459

Maryland, iron and steel from, statistics of.....Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184; MR 1886, pp 18, 33, 77; MR 1887, p 11; MR 1888, pp 14, 23; MR 1889–90, pp 10, 17; MR 1891, pp 12, 27, 54, 55, 61

Maryland; iron ore, brown, from near Timonium, analysis of............Bull 27, p 72

Maryland, lime production of..........................MR 1887, p 533; MR 1888, p 555

Maryland, limestone production of ....MR 1891, pp 464, 466

Maryland, marble production of.......................................MR 1891, pp 468–469

Maryland, mineral springs of.......................................Bull 32, pp 51–53; MR 1889–90, p 528; MR 1891, pp 603, 605

Maryland, minerals and rocks from, analyses of ....Bull 64, pp 41–43

Maryland, minerals of, the useful..........MR 1882, pp 690–693; MR 1887, pp 739–742

Maryland, Neocene beds of..Bull 84, pp 49–55

Maryland, Newark system in...Bull 85, pp 20, 85

Maryland, ocher production of ....MR 1891, p 595

Maryland; Potomac or younger Mesozoic flora ....Mon xv

Maryland, sandstone production of.......................................MR 1891, pp 461–462

Maryland; sandstone, Triassic, from near Hancock, analysis of..........Bull 55, p 80

Maryland; serpentine from Harford county, analysis of............MR 1889–90, p 400

Maryland, slate production of..........................MR 1891, pp 472–473

Maryland, topographic work in..........................Ann 5, p 7; Ann 6, p 8; Ann 9, pp 52, 55; Ann 12, I, p 26

Maryland, websterite from, analysis of..........................Bull 78, p 122

Massachusetts, altitudes in..........................Bull 5, pp 133–137; Bull 76

Massachusetts; Braintree argillites, fauna of the..........................Bull 10, pp 43–49

Massachusetts, boundary lines of, and cession of territory to general government..........................Bull 13, pp 25–26, 47–64

Massachusetts, brick industry of..........MR 1887, pp 536, 538; MR 1888, pp 560, 566

Massachusetts, building stone from, statistics of..........................MR 1882, pp 451–452; MR 1887, pp 513, 521; MR 1888, pp 536, 538; MR 1889–90, pp 373, 400–403; MR 1891, pp 457, 459, 461, 462, 464, 466

Massachusetts; Cambrian, literature of the lower..........Ann 10, I, pp 534–537, 543

Massachusetts, Cambrian rocks in, correlation of the..........................Bull 81, pp 72–78, 88–90, 93–94, 268–274, 381

Massachusetts; cape Ann, the geology of..........................Ann 9, pp 529–611

Massachusetts; cape Ann, the iron lithia micas of..........................Bull 42, pp 21–27

Massachusetts, clay production of..........................MR 1891, p 502

Massachusetts, copper production of..........................MR 1882, p 231

Massachusetts; feldspar from Hoosac tunnel, analysis of..........................Bull 55, p 79

Massachusetts; feldspars from Greylock mountain, analyses of..........................Bull 55, p 79

Massachusetts; fossil fishes and fossil plants of the Triassic rocks of New Jersey and the Connecticut valley..........................Mon XIV

Massachusetts, fossils from..........................Ann 8, II, pp 851–852; Ann 10, I, pp 572–575, 612, 615, 617–622, 624, 631, 637, 650; Bull 10, pp 43–49

Massachusetts, geologic and paleontologic investigations in..........Ann 6, pp 19, 20, 21, 22, 24, 36; Ann 7, pp 60–61, 63, 84; Ann 8, I, pp 124–125, 126, 127; Ann 9, pp 71, 72, 75, 117, 122; Ann 10, I, pp 115, 116, 117, 118, 170; Ann 11, I, pp 62–63, 64, 115; Ann 12, I, pp 54, 67, 69, 120, 121, 126

Massachusetts, geological maps of, listed..........................Bull 7, pp 52, 53, 54, 56, 57

Massachusetts, glacial investigations in..........Ann 3, pp 377, 379, 380; Ann 7, p 157

Massachusetts; granite from Bradford and Worcester, analyses of..MR 1889–90, p 401

Massachusetts, granite production of..........................MR 1891, pp 457–459

Massachusetts, iron and steel from, statistics of..........................Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184, 186; MR 1886, pp 17, 42; MR 1887, pp 11, 42; MR 1888, p 14; MR 1889–90, pp 10, 17; MR 1891, pp 12, 27, 61

Massachusetts; keratophyr from Marblehead neck, analysis of..........Bull 78, p 121

Massachusetts, lime production of..........................MR 1887, p 533; MR 1888, p 555

Massachusetts; limestone from Berkshire county, analysis of......MR 1889–90, p 403

Massachusetts, limestone production of..........................MR 1891, pp 464, 466

Massachusetts, maritime soils from, analyses of..........................Bull 27, pp 68–69

Massachusetts, mineral springs of..........Bull 32, pp 21–23; MR 1883–84, p 982; MR 1885, p 538; MR 1886, p 717; MR 1887, p 684; MR 1888, p 627; MR 1889–90, p 528; MR 1891, pp 603, 605

Massachusetts, minerals of, the useful.....MR 1882, pp 693–695; MR 1887, pp 742–745

Massachusetts; Martha's vineyard, clay, sand, etc., from, analyses of..........Bull 55, pp 89–90

Massachusetts; Martha's vineyard, Cretaceous deposits of..........Bull 82, pp 86–87

Massachusetts; Martha's vineyard, phosphates of..........................Bull 46, p 78

Massachusetts; Martha's vineyard, report on the geology of.......Ann 7, pp 297–363

Massachusetts; Nantucket, the geology of..........................Bull 53

Massachusetts, ocher production of..........................MR 1891, p 595

Massachusetts, pyrites from, statistics of..........................MR 1883–84, p 878; MR 1885, p 503; MR 1886, p 654

Massachusetts, rocks of.......Bull 80, pp 35, 253, 255
Massachusetts, salt from, statistics of.......MR 1882, pp 532–534
Massachusetts; sandstone from Maynard, Worcester, and Kibbe, analyses of.....MR 1889–90, p 402
Massachusetts, sandstone production of.......MR 1891, pp 461–462
Massachusetts; sea-coast swamps of eastern United States.......Ann 6, pp 353–398
Massachusetts; serpentine from Newburyport, analysis of.......Bull 27, p 63
Massachusetts surveyed topographically by coöperation of the state.......Ann 5, p xviii; Ann 6, p 4
Massachusetts, topographic work in.......Ann 5, pp 3–4; Ann 6, pp 3–5; Ann 7, pp 46–48; Ann 8, I, pp 98–99; Ann 9, pp 50–51
Massachusetts; Triassic formation of the Connecticut valley, structure of the.......Ann 7, pp 455–490
Massalongo (Abramo), biographical sketch of.......Ann 5, pp 379–380
Massive rocks, especially those of Cal., origin of the......Mon XIII, pp 164–175, 459
Mattes of Leadville, Colorado, analyses and assays of the.......Mon XII, pp 723–725
Maxwell's theory of viscosity, tensile, drawn, and other strains in their bearing on.......Bull 94, pp 17–29
Measurements of evaporation.......Ann 11, II, pp 30–34
Measurements of rainfall.......Ann 11, II, pp 23–30
Measurements of streams.......Ann 11, II, pp 2–22
Mechanism of solid viscosity.......Bull 94
Medicine bow range, literature of the geology of the.......Bull 86, pp 272–277, 504
Melaphyr of the Keweenaw series described.......Mon V, pp 68–77
Melting-point and pressure of mercury, measurement of the.......Bull 92, pp 76–77
Melville (W. H.), metacinnabarite from New Almaden, California....Bull 78, pp 80–83
Melville (W. H.), mineralogical notes.......Bull 90, pp 38–40
Melville (W. H.), powellite, a new mineral species.......Bull 90, pp 34–37
Melville (W. H.) and Hillebrand (W. F.), on the isomorphism and composition of thorium and uranous sulphates.......Bull 90, pp 26–33
Melville (W. H.) and Lindgren (W.), contributions to the mineralogy of the Pacific coast.......Bull 61
Menominee and Marquette regions of Michigan, the greenstone-schist areas of the.......Bull 62; Bull 86, passim
Merced river, California, hydrography of the.......Ann 12, II, p 322
Mercurial deposits of the Pacific slope and elsewhere.......Mon XIII
Mercuric sulphide, solution and precipitation of.......Mon XIII, pp 269, 419–437, 474
Mercury, electrical conductivity of, the effect of pressure on the....Bull 92, pp 68–77
Mercury. See, also, Quicksilver.
Meridian-Claiborne deposits.......Ann 12, I, pp 413–415
Merrimack group of rocks in New Hampshire.......Bull 86, pp 353–355
Mesas in the Plateau country.......Ann 6, p 127
Mesilla valley, N. M., irrigation possibilities and problems in...Ann 12, II, pp 279–281
Mesolite from Table mountain, Colorado, general description and chemical composition of.......Bull 20, p 35
Mesozoic areas of Virginia, the geology of the.......Mon VI, pp 1–9
Mesozoic Echinodermata of the United States.......Bull 97
Mesozoic flora, the older, of Virginia and North Carolina.......Mon VI
Mesozoic flora, the Potomac or younger.......Mon XV
Mesozoic fossils from Texas and Alaska.......Bull 4
Mesozoic Mollusca from the southern coast of the Alaskan peninsula..Bull 51, pp 64–70
Mesozoic strata in California.......Bull 19, pp 9–10, 20–21; Bull 51, pp 11–13
Mesozoic types of fossils from the Texan Permian.......Bull 77
Mesozoic and Cenozoic paleontology of California.......Bull 15
Mesozoic. See, also, Cretaceous; Jura-trias.

Metacinnabarite from California .... Bull 61, pp 22–23
Metacinnabarite from New Almaden, California .... Bull 78, pp 80–83
Metallic-paint production, statistics of .... MR 1891, pp 596–598
Metallurgy and mining of zinc in the United States .... MR 1882, pp 358–386
Metallurgy of copper .... Bull 26; MR 1882, pp 257–280
Metallurgy of copper, lead, zinc, etc., electrolysis in the .... MR 1882, pp 627–658
Metallurgy of nickel .... MR 1882, pp 415–420
Metallurgy of the Eureka ores, Nevada .... Mon VII, pp 158–164
Metallurgy of the Leadville region, Colorado .. Ann 2, pp 285–290; Mon XII, pp 609–751
Metals in ores, source of .... Mon XII, p 571
Metals, precious, discovery of the, in Colorado .... Mon XII, pp 7–10
Metals, precious, of Eureka, Nevada .... Mon VII
Metals, precious, statistics of the .... Ann 1, p 73; Ann 2, pp xxxiv–xxxvii, 331–401; MR 1882, pp 172–185; MR 1883–84, pp 312–321; MR 1885, pp 200–207; MR 1886, pp 104–108; MR 1887, pp 58–65; MR 1888, pp 36–42; MR 1889–90, pp 48–55; MR 1891, pp 74–80
Metals, precious. See, also, Gold; Precious metal; Silver.
Metamorphic origin of schistose and massive rocks discussed .... Ann 10, I, pp 362–364; Mon XIX, pp 107–111, 116–126
Metamorphic rocks compared with the Archean .... Mon XIII, pp 138, 458
Metamorphic rocks; crystalline schists, metasomatic origin of .... Ann 10, I, p 434
Metamorphic rocks; hornblende-gneiss .... Ann 10, I, pp 360–362
Metamorphic rocks; mica schists derived from greywacke .... Ann 10, I, pp 431–434
Metamorphic rocks of the Animikie series .... Ann 10, I, pp 402–408
Metamorphic rocks of the Coast ranges of California .... Mon XIII, pp 56–59, 63, 74–87, 181–182, 455–458; Bull 19, pp 7–12
Metamorphic rocks; phthanite in the Coast ranges of Cal .... Mon XIII, pp 105–108
Metamorphic rocks; porphyroids of Michigan .... Bull 62, pp 119–122
Metamorphic rocks; quartzite, Huronian, genesis of .... Bull 8, pp 48–52
Metamorphic rocks, review of work of Geological Survey upon the .. Ann 10, I, pp 49–51
Metamorphic rocks of the Penokee series derived from sedimentary rocks .. Ann 10, I, pp 365–402, 423–435, 439–444; Mon XIX, pp 107–111, 116–126
Metamorphic rocks of the Washoe district, Nevada .... Mon III, pp 190, 380
Metamorphic rocks; schistose structure, pressure in relation to .... Bull 59, p 43
Metamorphic rocks, structures in, produced by dynamic action ... Bull 62, pp 206–208
Metamorphic, volcanic, and Cretaceous rocks of northern California, general distribution of the .... Bull 33, pp 18–19
Metamorphism; alteration of diorite to gabbro near Baltimore, Md .. Bull 28, pp 33–49
Metamorphism; alteration of topaz to damourite at Stoneham, Me .. Bull 27, pp 9–15
Metamorphism; contact phenomena of traps of N. J .... Bull 67, pp 25–31, 34, 45–53
Metamorphism; derivation of serpentine and other rocks near Baltimore, Maryland .... Bull 28, pp 50–59
Metamorphism, dynamic, in eruptive rocks, a contribution to the subject of .. Bull 62
Metamorphism in relation to depth .... Ann 10, I, pp 457–458
Metamorphism in the Coast ranges of California .... Mon XIII, pp 56–59, 63, 74–87; Bull 19, pp 7–8
Metamorphism in the Coast ranges of California, conditions attending .... Mon XIII, pp 129–139
Metamorphism in the Coast ranges of California, eras of .... Mon XIII, pp 131, 187, 210
Metamorphism in the Coast ranges of California, proofs of .... Mon XIII, p 129
Metamorphism in the Huronian of the northwestern states .... Ann 5, pp 241–242
Metamorphism in the Penokee district .... Mon XIX, pp 65, 467–468
Metamorphism in the Sierra nevada .... Mon XIII, pp 208–213
Metamorphism, macrostructural, of massive rocks .... Bull 62, pp 46–50, 204–208
Metamorphism, microstructural, of massive rocks .... Bull 62, pp 43–46, 201–204

Metamorphism, mineralogical, of massive rocks .... Bull 62, pp 50–63, 208–217

Metamorphism; new structures produced by dynamic action .... Bull 62, pp 206–208

Metamorphism not marked about intrusive rocks of Mosquito range, Colorado .... Mon XII, p 307

Metamorphism of Archean igneous rocks in Delaware .... Bull 59

Metamorphism of country rock .... Mon XIII, pp 392–394

Metamorphism of eruptive rocks .... Bull 28, pp 9–11

Metamorphism of eruptive rocks, review of knowledge concerning .. Bull 62, pp 34–63

Metamorphism of igneous rocks of Yellowstone park .... Ann 12, I, pp 658–659

Metamorphism of massive rocks, three types of .... Bull 62, p 43

Metamorphism, products of .... Bull 62, pp 209–213

Metamorphism resulting in soils .... Ann 12, pp 250–268

Metamorphism; secondary enlargements of minerals in rocks .... Bull 8

Metamorphism; subaërial decay of rocks .... Bull 52, pp 12–34, 39–42

Metamorphism; the gneiss-dunyte contacts of Corundum hill, North Carolina, in relation to the origin of corundum .... Bull 42, pp 45–63

Metamorphism; the greenstone-schist areas of the Menominee and Marquette regions of Michigan .... Bull 62, pp 64–217

Metamorphism, value of the microscope in the study of .... Bull 62, pp 34–40

Metasomatic origin of crystalline schists .... Ann 10, I, p 434

Meteoric changes, diversity of .... Ann 2, pp 410–411

Meteoric irons, two new, and an iron of doubtful nature .... Bull 42, pp 94–97

Meteorite, a new, from Mexico .... Bull 64, pp 29–30

Meteorites from Johnson county, Ark., and Allen county, Ky ...... Bull 55, pp 63–64

Meteorites, seven new, descriptions and analyses of .... Bull 78, pp 91–97

Meteorites, six new, descriptions and analyses of .... Bull 60, pp 103–104

Meteorites, two new, descriptions and analyses of .... Bull 90, pp 45–46

Meteorology of India .... Ann 12, II, pp 403–404

Meters for stream measurement .... Ann 11, II, pp 6–14

Mexican cement, ancient, analysis of .... Bull 27, p 72

Mexico; bismuthinite from Sinaloa, description and analysis of .... Bull 90, p 40

Mexico, copper production of .... MR 1883–84, pp 356, 373; MR 1885, p 229; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1891, pp 101, 102

Mexico, Cretaceous deposits of .... Bull 82, pp 201–202

Mexico, fossil plants of, literature of the .... Ann 8, II, pp 825–826

Mexico, geological maps of, list of .... Bull 7, pp 144–145

Mexico, gold and silver production of, compared with that of other countries ..... MR 1883–84, pp 319–320

Mexico, lead production of .... MR 1883–84, p 434; MR 1885, p 264; MR 1887, pp 99–100; MR 1888, pp 79–81

Mexico, mining law of .... MR 1883–84, p 999

Mexico, quicksilver ores in .... Mon XIII, pp 16–19

Mexico, tin deposits of .... MR 1883–84, pp 623–624

Mica andesite from a canyon on the east side of San Mateo mountain, New Mexico, analysis of .... Bull 42, p 139

Mica group, a theory of the .... Bull 64, pp 9–19

Mica group, studies in the .... Bull 55, pp 13–18

Mica mining in North Carolina .... MR 1887, pp 661–671

Mica schist derived from greywacke, Penokee series .... Ann 10, I, pp 431–434

Mica, statistics of .... MR 1882, pp 583–584; MR 1883–84, pp 906–912; MR 1885, pp 518–520; MR 1886, pp 5, 7, 9; MR 1887, pp 660–671; MR 1888, pp 614–615; MR 1889–90, pp 474–475

Micas of cape Ann, Massachusetts .... Bull 42, pp 21–27

Micas, the lithia, researches on .... Bull 42, pp 11–27

Micas, vermiculites, and chlorites, on the constitution of certain ... Bull 90, pp 11–21

Michigan, altitudes in..................Bull 5, pp 138–146; Bull 72, p 204; Bull 76

Michigan; Archean formations of the northwestern states........Ann 5, pp 175–242

Michigan, boundary lines of, and formation of, from territory northwest of Ohio river..Bull 13, pp 28–29, 113–114

Michigan, brick industry of..........MR 1887, pp 536, 538; MR 1888, pp 560–561, 566

Michigan, bromine industry of......................MR 1885, p 487; MR 1886, p 642; MR 1887, p 626; MR 1888, p 613; MR 1889–90, p 493; MR 191, p 579

Michigan, building stone from, statistics of....MR 1882, p 451; MR 1888, pp 540, 544; MR 1889–90, pp 373, 403; MR 1891, pp 461, 462, 464, 466

Michigan, coal area and statistics of......Ann 2, p xxviii; MR 1883–84, pp 12, 50–51; MR 1885, pp 11, 34–35; MR 1886, pp 225, 230, 279–280; MR 1887, pp 169, 270–271; MR 1888, pp 169, 171, 284–285; MR 1889–90, pp 146, 226; MR 1891, pp 180, 260

Michigan; copper-bearing rocks of lake Superior, nature, structure, and extent of the...Ann 3, pp 93–188; Mon v

Michigan, copper from, statistics of....Ann 2, p xxix; MR 1882, pp 215, 216, 218–220; MR 1883–84, pp 327, 329, 331–334; MR 1885, pp 210, 211–214; MR 1886, pp 112, 113–116; MR 1887, pp 69, 70–74; MR 1888, pp 53, 54–57; MR 1889–90, pp 59–64; MR 1891, pp 83, 85, 86

Michigan, fossils from.......Ann 8, II, pp 893–894; Mon XVI, pp 121, 126, 177, 178, 206

Michigan, geologic and paleontologic work in.........Ann 3, p 20; Ann 4, pp 24–25; Ann 5, pp 24–25; Ann 6, p 44; Ann 7, p 71; Ann 8, I, pp 135, 137–138; Ann 9, pp 72, 80–81, 85; Ann 10, I, pp 123–124; Ann 11, I, p 78; Ann 12, I, pp 85–86

Michigan, geologic maps of, listed ....Bull 7, pp 77, 78, 79, 80, 81, 82, 83, 85, 87, 88

Michigan, glacial investigations in...................Ann 3, pp 322–337; Ann 7, p 157

Michigan, gold and silver statistics of............Ann 2, p 385; MR 1882, pp 176, 177, 178; MR 1887, p 59; MR 1888, p 37; MR 1889–90, p 49; MR 1891, pp 75, 76

Michigan, gypsum deposits and industry of............MR 1882, p 527; MR 1883–84, pp 810–811; MR 1885, p 462; MR 1886, p 621; MR 1887, pp 595, 601; MR 1889–90, p 465; MR 1891, pp 580, 581

Michigan, iron and steel from, statistics of...............Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, pp 252, 264–266, 267–268; MR 1885, pp 182, 188; MR 1886, pp 14, 18, 62–72; MR 1887, pp 11, 16, 34–39; MR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 17; MR 1891, pp 12, 16, 54, 55, 61

Michigan, iron-ore mines of, total production to date of the larger....MR 1891, p 16

Michigan, lime production of.......................MR 1887, p 533; MR 1888, p 555

Michigan, limestone production of ....MR 1891, pp 464, 466

Michigan, manganese ore in ....MR 1885, p 346; MR 1886, pp 188–190; MR 1887, p 151; MR 1888, pp 124, 128; MR 1891, p 135

Michigan, Menominee and Marquette regions of, the greenstone-schist areas of the ....Bull 62

Michigan, mineral springs of................Bull 32, pp 145–150; MR 1883–84, p 982; MR 1885, p 538; MR 1886, p 717; MR 1887, p 684; MR 1888, p 627; MR 1889–90, p 529; MR 1891, pp 603, 606

Michigan, minerals of, the useful.........MR 1882, pp 695–697; MR 1887, pp 745–747

Michigan, natural gas consumption in..................................MR 1891, p 438

Michigan; novaculite from Marquette, analysis of ....Bull 60, p 151

Michigan; observations on the junction between the Eastern sandstone and the Keweenaw series on Keweenaw point, lake Superior.................Bull 23

Michigan; on secondary enlargements of mineral fragments in certain rocks, mostly from Michigan, Wisconsin, and Minnesota.......................Bull 8

Michigan; on the classification of the early Cambrian and pre-Cambrian formations: a brief discussion of principles, illustrated by examples drawn mainly from the lake Superior region.......................Ann 7, pp 365–454

Michigan; Penokee iron-bearing series of Michigan and Wisconsin........Ann 10, I, pp 341–508; Mon XIX

Michigan, salt from, statistics of..........MR 1882, pp 532-534, 535-537; MR 1883-84, pp 827, 828-830; MR 1885, pp 474-476; MR 1886, pp 629-632; MR 1887, pp 611-614; MR 1888, pp 597-600; MR 1889-90, pp 483-484; MR 1891, pp 574-575

Michigan, salt-making in..........Ann 7, pp 504, 505, 507, 519-521

Michigan, sandstone from, analysis of..........Bull 27, p 66

Michigan, sandstone production of..........MR 1891, pp 461-462

Michigan, strata in, succession of..........Bull 80, pp 41, 175, 177-178

Michigan, topographic work in..........Ann 11, I, p 38; Ann 12, I, p 29

Michigan and Wisconsin, rocks from Menominee river, analyses of.....Bull 55, p 81

Micropegmatitic structure in granite-porphyry..........Mon XX, p 344

Micropegmatitic structure in rhyolite..........Mon XX, p 377

Microscope, quantitative determination of silver by means of the..Ann 6, pp 323-352

Microscope, value of the, in the study of metamorphism..........Bull 62, pp 34-36

Microscopic investigation of rocks..........Ann 10, I, pp 45-52

Microscopic petrography. See Petrography.

Microscopic studies in the Archean formations of the northwestern states......Ann 5, pp 209-242

Microscopical characters of the rock forming Obsidian cliff, Yellowstone national park..........Ann 7, pp 273-279

Microstructural metamorphism of massive rocks..........Bull 62, pp 46-50, 204-208

Middle park beds, Colorado..........Bull 83, p 137

Miliolite limestone of Florida..........Bull 84, pp 104-105

Mineral, a probably new, from Colorado, description of..........Bull 20, pp 107-109

Mineral and economic resources of Martha's vineyard..........Ann 7, pp 353-360

Mineral association of fayalite and lithophysæ..........Ann 7, pp 279-282

Mineral enlargements in rock alteration..........Bull 8, pp 37-52

Mineral fragments of certain rocks, secondary enlargement of..........Bull 8

Mineral notes, miscellaneous..........Bull 20, pp 89-99

Mineral paints, analyses of..........MR 1885, pp 528, 530, 531

Mineral paints, statistics of..........MR 1891, pp 595-598

Mineral phosphates; apatites and phosphorites, descriptions of....Bull 46, pp 22-59

Mineral resources, general, and lesser metals..........Ann 1, p 74

Mineral resources of the West..........Ann 11, II, p 210

Mineral, rock, and ore analyses..........Bull 9, pp 9-18

Mineral species, new, from Colorado..........Bull 20, pp 100-109

Mineral springs of the United States, lists and analyses of the..........Bull 32

Mineral springs of Knoxville district, California..........Mon XIII, p 281

Mineral springs of Lahontan basin..........Mon XI, pp 47-54, 60

Mineral springs, salinity of, in connection with Molluscan life......Bull 11, pp 30-38

Mineral statistics of the United States in 1882..........Ann 4, pp 63-68; MR 1882

Mineral statistics of the United States in 1883-84.......Ann 6, pp 89-92; MR 1883-84

Mineral statistics of the United States in 1885....Ann 7, pp 38-39, 131-134; MR 1885

Mineral statistics of the United States in 1886...Ann 8, I, pp 85-87, 195-200; MR 1886

Mineral statistics of the United States in 1887....Ann 9, pp 27-28, 134-140; MR 1887

Mineral statistics of the United States in 1888..Ann 10, I, pp 52-53, 182-188; MR 1888

Mineral statistics of the United States in 1889-90..Ann 11, I, pp 130-131; MR 1889-90

Mineral statistics of the United States in 1891........Ann 12, I, pp 129-134; MR 1891

Mineral waters, action of, in formation of ores..........Mon XII, p 563

Mineral waters, action of, in silicification..........Mon XIII, p 137

Mineral waters, analyses of..........Ann 8, II, p 621; Ann 9, pp 639, 673; Bull 27, pp 75-76; Bull 42, pp 147-149; Bull 55, p 92; Bull 60, pp 171-174

Mineral waters, chemical action of..........Mon XIII, pp 134-138

Mineral waters, concentrated, treatment of, in analysis..........Bull 47, pp 25-28

Mineral waters, statistics of..........MR 1883-84, pp 978-987; MR 1885, pp 536-543; MR 1886, pp 715-721; MR 1887, pp 680-687; MR 1888, pp 623-630; MR 1889-90, pp 521-535; MR 1891, pp 601-610

Mineralizing agents, effects of, upon crystallization of igneous magmas.....Ann 12, I, pp 658–659
Mineralogical composition and structure of peridotite of Elliott county, Kentucky.....Bull 38, pp 10–20
Mineralogical constitution of the loess.....Ann 6, pp 281–283
Mineralogical metamorphism of massive rocks.....Bull 62, pp 50–63, 208–217
Mineralogical metamorphism; progress of alteration of original minerals...Bull 62, pp 214–217
Mineralogical notes.....Bull 55, pp 48–55; Bull 60, pp 129–137
Mineralogical variations in volcanic rocks from Tewan mountains, New Mexico.....Bull 66, pp 17–19
Mineralogy of the Pacific coast, contributions to the.....Bull 61
Mineralogy of the Rocky mountains, contributions to the.....Bull 20
Minerals, alteration of, in Comstock lode.....Mon III, p 20
Minerals, associated rare, from Utah.....Bull 20, pp 83–88
Minerals, certain rare copper, from Utah, notes on.....Bull 55, pp 38–47
Minerals composing lithophysæ.....Ann 7, pp 266–272
Minerals, effects of dynamic action on.....Bull 62, pp 205–206
Minerals from the basalt of Table mountain, Golden, Colorado.....Bull 20, pp 13–39
Minerals from the neighborhood of Pike's peak.....Bull 20, pp 40–73
Minerals, new, in Knoxville district, California.....Mon XIII, pp 279–280
Minerals of Eureka district, Nevada.....Mon VII, p 184
Minerals of Litchfield, Maine.....Bull 42, pp 28–38
Minerals of North Carolina, analyses of.....Bull 74, pp 1–85
Minerals of Redington mine, Knoxville district, California.....Mon XIII, pp 284–286
Minerals of Ruby hill, Eureka district, Nevada.....Mon VII, pp 52–59
Minerals of the crystalline metamorphics of the Coast ranges.....Mon XIII, pp 74–87
Minerals of the granite of Wisconsin and Michigan.....Ann 10, I, p 355
Minerals, origin of.....Mon XII, pp 569–581
Minerals, secondary, and their origin.....Bull 62, pp 209–214
Minerals and rocks from Maryland, analyses of.....Bull 64, pp 41–43
Mines, classification of.....Ann 2, p 341
Mining and metallurgy of zinc in the United States.....MR 1882, pp 358–386
Mining and milling on the Comstock lode, Nevada, mechanical appliances used in.....Ann 1, pp 50–52, 72
Mining and miners, Comstock.....Mon IV
Mining, coal-, industry, general view of the.....MR 1882, pp 1–7
Mining geology of Eureka district, Nevada.....Ann 4, pp 221–251; Mon VII
Mining industry, geology and, of Leadville, Colorado....Ann 2, pp 201–290; Mon XII
Mining law, historical sketch of.....MR 1883–84, pp 988–1004; MR 1886, pp 722–790
Minnesota, altitudes in.....Bull 5, pp 147–154; Bull 72, pp 198–200, 206–214; Bull 76
Minnesota; Archean formations of the northwestern states.....Ann 5, pp 175–242
Minnesota; artesian wells of the Red river valley.....Ann 11, II, pp 267–268
Minnesota, boundary lines of, and formation of state.....Bull 13, pp 118–119
Minnesota; brick clay from New Ulm, analysis of.....Bull 60, p 151
Minnesota, brick industry of.....MR 1887, pp 536, 538; MR 1888, p 561
Minnesota, building stone from, statistics of.....MR 1882, p 451; MR 1887, p 516; MR 1888, p 540; MR 1889–90, pp 373, 403–405; MR 1891, pp 457, 459, 461, 462, 464, 466
Minnesota, Cambrian rocks of.....Bull 81, pp 181–187, 334
Minnesota, Carboniferous rocks in, classification of the.....Bull 80, pp 167–168
Minnesota cement, hydraulic, product of.....MR 1891, p 532
Minnesota, clay production of.....MR 1891, p 523
Minnesota, coal discovered in.....MR 1891, p 260
Minnesota; copper-bearing rocks of lake Superior, nature, structure, and extent of the.....Ann 3, pp 93–188; Mon V

ta, Cretaceous rocks in..Bull 82, pp 142, 165
ta; driftless area of the upper Mississippi valley..........Ann 6, pp 199–322
ta, feldspars from gabbros from, analyses of....................Bull 78, p 122
ta, fossils from..Ann 8, II, p 895
ta, geologic and paleontologic investigations in.............Ann 4, pp 30–31;
Ann 5, pp 21, 25–26; Ann 6, pp 40–44, 74, 75; Ann 7, pp 69–71, 72, 80, 81; Ann 8, I, pp 135–137, 143; Ann 9, pp 72, 81, 82, 85; Ann 10, I, pp 123, 124, 125, 126; Ann 11, I, pp 75, 78, 104
ta, geologic maps of, listed..............Bull 7, pp 89, 91, 92, 93, 96, 97, 98, 101
ta, glacial investigations in.......................Ann 3, pp 382–384, 388–393
ta; glacial lake Agassiz, the upper beaches and deltas of the........Bull 39
ta, granite production of..................................MR 1891, pp 457, 459
ta, iron and steel from, statistics of....MR 1882, pp 120, 129, 131; MR 1883-
pp 252, 266–267; MR 1885, pp 182, 188; MR 1886, pp 14, 18, 62, 73–77; MR
7, pp 11, 16, 39–42; MR 1888, p 17; MR 1889–90, pp 10, 17; MR 1891, pp 12, 22
ta, lime production of......................MR 1887, p 533; MR 1888, p 555
a, limestone production of ....MR 1891, pp 464, 466
a, mineral springs of...................Bull 32, pp 158–159; MR 1891, p 606
a, minerals of, the useful........MR 1882, pp 697–698; MR 1887, pp 747–749
a; on secondary enlargements of mineral fragments in certain rocks,
stly from Michigan, Wisconsin, and Minnesota........................Bull 8
a; on the classification of the early Cambrian and pre-Cambrian for-
tions: a brief discussion of principles, illustrated by examples drawn
inly from the lake Superior region ....Ann 7, pp 365–454
a pipestone, red, analysis and tests of ....MR 1889–90, p 404
a; Pigeon point, rocks from, analyses of..................Bull 55, pp 81–83
a, sandstone production of...........................MR 1891, pp 461, 462
boundaries of the...Bull 84, pp 21–22
fresh-water, marine Eocene, and other fossil Mollusca of western
rth America...Bull 18
n California ....Mon XIII, pp 218–219, 461
ime in the Grand canyon district, erosion in....................Ann 2, p 67
See, also, Neocene.
pi, altitudes in..............................Bull 5, pp 155–156; Bull 76
pi, boundary lines of, and formation of state ....Bull 13, pp 30, 103–104
pi, brick industry of.......................MR 1887, p 536; MR 1888, p 561
pi, clay production of.......................................MR 1891, p 508
i, coal, discovery of, in ....MR 1891, p 260
i, Cretaceous rocks of.........................Bull 82, pp 105–106, 218–219
i, Eocene deposits in..............................Bull 83, pp 66–70, 83, 87
i, fossils from....Ann 4, pp 293, 295, 298, 310, 311, 312; Ann 8, II, pp 879–880
i, geologic and paleontologic work in..................Ann 4, pp 43, 48–49;
Ann 6, p 74; Ann 8, I, p 165; Ann 9, pp 110–111, 122;
Ann 10, I, p 157; Ann 11, I, pp 67, 108; Ann 12, I, p 75
i, geologic maps of, listed...................Bull 7, pp 103, 104, 105, 106, 140
i, iron-ore deposits of.......................................MR 1887, pp 48–49
i, marl deposits of........................MR 1885, p 453; MR 1886, p 618
i, mineral springs of.......................................Bull 32, pp 94–97;
MR 1883–84, p 982; MR 1885, p 538; MR 1886, p 717; MR 1887, p 684;
MR 1888, p 627; MR 1889–90, pp 522, 529; MR 1891, pp 603, 606
i, minerals of, the useful.......MR 1882, pp 698–699; MR 1887, pp 749–750
i, Neocene beds of..Bull 84, pp 160–167
i; water from a well near Clinton, analysis of................Bull 64, p 60
i valley, upper, driftless area of the ....Ann 6, pp 199–322
altitudes in.......................Bull 5 pp 157–164; Bull 72, p 217; Bull 76

Missouri, barytes industry in, statistics of the .... MR 1891, p 599

Missouri, boundary lines of, and formation of state .... Bull 13, pp 30, 116-117

Missouri, building stone from, statistics of .... MR 1882, p 451; MR 1886, p 541; MR 1887, p 516; MR 1888, p 540; MR 1889-90, pp 373, 405-408

Missouri, Cambrian rocks of .... Bull 81, pp 199-201, 229, 339-341, 385

Missouri, classification of rocks in .... Bull 80, pp 144-145, 147, 151, 157, 168-170

Missouri, clay, brick, and pottery industry of .... MR 1882, pp 466, 470; MR 1887, pp 536, 538; MR 1888, p 561; MR 1891, pp 511-513

Missouri, coal area and statistics of .... Ann 2, p xxviii; MR 1882, pp 60-61; MR 1883-84, pp 12, 51-52; MR 1885, pp 11, 35-36; MR 1886, pp 225, 230, 280-282; MR 1887, pp 169, 171, 272-275; MR 1888, pp 169, 171, 285-289; MR 1889-90, pp 147, 226-228; MR 1891, pp 180, 261-268

Missouri, cobalt deposits in .... MR 1882, p 421; MR 1883-84, p 545; MR 1885, pp 362, 364; MR 1889-90, p 124

Missouri, coke in, the manufacture of .... MR 1887, pp 383, 389, 405; MR 1888, pp 395, 400, 411-412; MR 1891, pp 360, 366, 382

Missouri, copper from, statistics of .... Ann 2, p xxix; MR 1882, pp 216, 230; MR 1883-84, pp 329, 342; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889-90, p 60; MR 1891, pp 83, 84

Missouri, fossils from .... Ann 8, II, p 896

Missouri, flora of the outlying Carboniferous basins of southwestern .... Bull 98

Missouri, geologic investigations in .... Ann 5, p 21; Ann 7, p 78; Ann 9, p 103; Ann 10, I, pp 124-125; Ann 11, I, pp 59, 75, 80-81; Ann 12, I, pp 56, 62, 88, 90

Missouri, geologic maps of, listed .... Bull 7, pp 127-131

Missouri, granite production of .... MR 1891, pp 457, 459

Missouri, iron and steel from, statistics of .... Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883-84, pp 252, 268-270; MR 1885, pp 182, 184; MR 1886, pp 14, 18, 97-98; MR 1887, pp 11, 16, 46-47; MR 1888, pp 14, 17, 23; MR 1889-90, pp 10, 12, 17; MR 1891, pp 12, 26, 54, 55, 61

Missouri; iron ore from Iron mountain, composition of .... MR 1889-90, pp 46-47

Missouri; latitudes and longitudes of certain points in Missouri, Kansas, and New Mexico .... Bull 49

Missouri, lead from, statistics of .... Ann 2, p xxviii; MR 1882, p 312; MR 1883-84, pp 416, 425; MR 1885, pp 248, 259; MR 1886, p 147; MR 1887, p 110; MR 1889-90, p 80; MR 1891, p 105

Missouri, lime production of .... MR 1888, p 555

Missouri, limestones from localities in, analyses of .... Bull 78, p 125; MR 1889-90, pp 406-407

Missouri, limestone production of .... MR 1891, pp 464, 466

Missouri, manganese ore in .... MR 1885, pp 346-348

Missouri, mineral springs of .... Bull 32, pp 164-170; MR 1883-84, p 982; MR 1885, p 538; MR 1886, p 717; MR 1887, p 684; MR 1888, p 627; MR 1889-90, pp 522, 529; MR 1891, pp 603, 606

Missouri, minerals of, the useful .... MR 1882, pp 699-702; MR 1887, pp 750-753

Missouri, natural-gas consumption in .... MR 1891, p 438

Missouri, nickel production of .... MR 1882, p 403; MR 1883-84, p 539; MR 1889-90, p 124

Missouri, ochre production of .... MR 1891, p 595

Missouri, petroleum statistics of .... MR 1889-90, pp 292, 361-362

Missouri, sandstone production of .... MR 1891, pp 461-462

Missouri, topographic work in .... Ann 6, p 11; Ann 7, pp 53-54; Ann 8, I, p 103; Ann 9, p 56; Ann 10, I, p 93

Missouri; water from Lebanon, analysis of .... Bull 60, p 172

Missouri; water from Webster grove, near St. Louis, analysis of .... Bull 78, p 129

Missouri, zinc deposits of, investigation of the .... Ann 11, I, pp 54, 80-81

Missouri, zinc and zinc works in, statistics of........................Ann 2, p xxix; MR 1882, pp 347, 368–373; MR 1883–84, p 475; MR 1885, p 273; MR 1886, pp 154, 155; MR 1887, p 113; MR 1888, p 92; MR 1889–90, p 88

Missouri, zinc region of, analyses of rocks and clays from the ......Bull 90, pp 63–64

Missouri river basin, hydrography of....................................Ann 11, II, pp 41–43, 94, 107; Ann 12, II, pp 236–238

Mixite from Utah, description and analysis of ....Bull 55, pp 45–46

Mokelumne river, California, hydrography of the....................Ann 12, II, p 323

Mollusca, a review of the nonmarine fossil, of North America......Ann 3, pp 403–550

Mollusca, doubtful species of nonmarine fossil, of North America ...Ann 3, pp 478–479

Mollusca, fossil, Cretaceous, from Vancouver island region..........Bull 51, pp 33–48

Mollusca, fossil, description of species of, from the Texan Permian...Bull 77, pp 19–29

Mollusca, fossil, from the Chico-tejon series of California ....Bull 51, pp 4–27

Mollusca, fossil; Gasteropoda and Cephalopoda of the Raritan clays and greensand marls of New Jersey ....Mon XVIII

Mollusca, fossil, Mesozoic, from the southern coast of Alaska.......Bull 51, pp 64–70

Mollusca, fossil, nonmarine, of North America, table of.............Ann 3, pp 472–477

Mollusca, fossil, of the Puget group ....Bull 51, pp 49–63

Mollusca, fossil and recent, of the Great basin, description and tables of....Bull 11, pp 23–25, 44, 49

Mollusca, list of marine, comprising the Quaternary and recent forms, from American localities between cape Hatteras and cape Roque, including the Bermudas ....Bull 24

Mollusca; marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America...Bull 18

Mollusca, Mesozoic, of Alaska.....................................Bull 4, pp 10–15

Mollusca of the fresh-water North American Jurassic ....Bull 29, pp 15–23

Mollusca of the Wasatch group, description of species of the ....Bull 34, pp 20–32

Mollusca, Quaternary and recent, of the Great basin, with descriptions of new forms..Bull 11, pp 13–49

Mollusca. See, also, Brachiopoda; Cephalopoda; Gasteropoda; Lamellibranchiata; Pteropoda.

Molybdenum, statistics of...MR 1882, p 446

Mono lake, California, analysis of water of............Ann 8, I, p 293; Bull 42, p 149

Mono lake, California, deposits of..................................Mon XI, pp 221–222

Mono lake, California, description and history of.................Ann 8, I, pp 269–320

Mono lake, California, obsidian of...Ann 7, p 292

Mono lake, California, old shorelines of.......................................Mon I, p 16

Mono valley, California, Quaternary or Pleistocene history of............Ann 8, I, pp 261–394; Mon I, pp 306, 311, 337

Monoclines in the Plateau country...Ann 6, p 118

Monoclines. See, also, Faulting; Faults.

Monocotyledons of the Dakota group...........................Mon XVII, pp 37–41

Monocotyledons of the Laramie flora...............................Bull 37, pp 16–18

Montalban group of rocks in New Hampshire and Massachusetts............Bull 86, pp 351–355, 368, 463–464

Montana, altitudes in............Bull 5, pp 165–168; Bull 72, pp 196, 223–224; Bull 76

Montana, boundary lines of, and formation of the territory ....Bull 13, pp 32, 122

Montana; Butte city, mines and reduction works of.........MR 1883–84, pp 374–396

Montana, Cambrian rocks of.................................Bull 81, pp 162, 163, 323–326

Montana, coal area and statistics of...........Ann 2, p xxviii; MR 1882, pp 61–62; MR 1883–84, pp 12, 52–55; MR 1885, pp 11, 36–39; MR 1886, pp 225, 230, 282–288; MR 1887, pp 169, 275–276; MR 1888, pp 169, 171, 289–292; MR 1889–90, pp 147, 228–231; MR 1891, pp 180, 269–271

Montana, coals and charcoals from, analyses of..............MR 1889-90, pp 229, 230

Montana, coke in, the manufacture of............ MR 1883-84, pp 168-169; MR 1885, pp 80, 92-93; MR 1886, pp 378, 384, 402; MR 1887, pp 383, 389, 405-406; MR 1888, pp 395, 400, 412; MR 1891, pp 360, 361, 366, 382-383

Montana, constitution of, extract from the, relating to irrigation....Ann 11, II, p 241

Montana, copper from, statistics of.........Ann 2, p xxix; MR 1882, pp 216, 224-225; MR 1883-84, pp 329, 336-340; MR 1885, pp 210, 215-217; MR 1886, pp 112, 117-118; MR 1887, pp 69, 74; MR 1888, pp 54, 57-58; MR 1889-90, p 60; MR 1891, pp 83, 84, 91-99

Montana, Cretaceous rocks of.........................Bull 82, pp 145, 149, 161, 166-179

Montana; descloizite from Beaverhead county, analysis of.......Bull 60, pp 130-131

Montana, Devonian rocks of ....Bull 80, p 224

Montana; eruptive rock from Bear creek, analysis of..................Bull 78, p 123

Montana, fossils from....Ann 6, pp 549-557; Ann 8, II, pp 904-906; Bull 34, pp 25, 28, 31

Montana, geologic and paleontologic investigations in...............Ann 4, pp 42-43; Ann 5, pp 28-30, 50, 55-56; Ann 6, pp 48-53; Ann 7, pp 77-78, 85-87; Ann 8, I, pp 146-148; Ann 9, pp 111-113, 128; Ann 10, I, pp 22-23, 130-131, 139, 144; Ann 11, I, p 82; Ann 12, I, pp 56, 91, 92-94

Montana, geologic maps of, listed...........................Bull 7, pp 114, 115, 116

Montana; glaciers, existing, of the United States..................Ann 5, pp 303-355

Montana, gold and silver from, statistics of................Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883-84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36-37; MR 1889-90, p 49; MR 1891, pp 75, 77, 78, 79

Montana, iron in, statistics of..................................MR 1882, p 147; MR 1883-84, p 285; MR 1888, pp 34-35; MR 1891, pp 12, 27

Montana; iron ore, magnetic, from near Bozeman, analysis of...........Bull 9, p 17

Montana, irrigation surveys, engineering, hydrography, segregations, etc., in....Ann 10, II, pp viii, 17-18, 58, 59, 60, 61, 71-72, 89, 91-93; Ann 11, II, pp 113-133; Ann 12, II, pp 127-165

Montana, Laramie flora, types of the, largely from...........................Bull 37

Montana, lead from, statistics of...............................MR 1882, p 311; MR 1883-84, pp 416, 422-424; MR 1885, pp 248, 257-258; MR 1887, pp 109-110; MR 1888, p 89; MR 1889-90, p 80

Montana, lime production of......................................MR 1888, p 555

Montana, manganese ore in.......................................MR 1885, p 349

Montana; mineral resin from Livingston, a supposed............Bull 78, pp 105-108

Montana, mineral springs of....................Bull 32, pp 177-180; MR 1891, p 606

Montana, minerals of, the useful.........MR 1882, pp 754-756; MR 1887, pp 753-755

Montana, Neocene beds of ....Bull 84, pp 287-288

Montana, reservoir sites and irrigable lands in ....Ann 11, II, pp 306, 310

Montana, rocks from, analyses of.............Bull 55, pp 83-84; Bull 60, pp 152-154

Montana, sandstone production of ....MR 1891, pp 461, 462

Montana, tin ore in ....MR 1883-84, p 614

Montana, topographic work in ......Ann 4, pp 9-11; Ann 8, I, pp 105-106; Ann 9, p 59; Ann 10, I, p 97; II, pp 17, 71-72; Ann 11, II, p 305; Ann 12, I, p 48

Montana; water from near Bozeman, analysis of.......................Bull 27, p 75

Montana; water from White sulphur springs, analysis of..............Bull 27, p 75

Montana, waters from four localities in, analyses of.................Bull 9, pp 31-32

Moraine, terminal, of the second glacial epoch...................Ann 3, pp 291-402

Moraine. See, also, Glacial; Glacier.

Morasses, economic uses of.....................................Ann 10, I, pp 303-310

Morasses, effect of certain plants on the formation of..........Ann 10, I, pp 285-295

Morasses, fresh-water, of United States, with description of Dismal swamp.....Ann 10, I, pp 255-339

s. See, also, Swamps.
(W. F.), administrative report for 1890–91....................Ann 12, I, p 145
). A.), the phosphate deposits of South Carolina.........MR 1882, pp 504–521
o range, Colorado, general geology, rock formations, and descriptive ology of the.........................Ann 2, pp 211–214; Mon XII, pp 19–201
'esert, Maine, geology of ....Ann 8, II, 987–1061
n building in the Great basin, evidence of, in the Lahontan basin......Ann 3, pp 232–233
n building, nature of the process of.........................Ann 6, pp 195–197
n building. See, also, Diastrophism.
n growth, especially in the Bonneville basin ....Mon I, pp 359–360
n structure and the Rocky mountain structure...........Mon XII, pp 24–27
n structure, diverse, in western United States............Ann 6, pp 191–195
nd gossan ores of Virginia, analyses of........................MR 1891, p 24
e, a product of mineralogical metamorphism..................Bull 62, p 212
e from Alexander county, North Carolina, description and analysis ....Bull 55, pp 13–14
s, index to the known fossil, of the world........................Bull 71
s, systematic review of our present knowledge of..........Bull 31, pp 9–18
enty years of progress in the manufacture of.............MR 1891, pp 65–66
t, age of the beds of..Bull 84, p 35
t, the geology of...Bull 53
a new mineral from California, description of........Mon XIII, pp 372–373
ne, compressibility of..................................Bull 92, pp 40–41
from Arkansas, Magnet cove, description and analysis of.....Bull 90, p 38
from Colorado, Table mountain, description and analysis of..Bull 20, p 36
as. See Gas.
ad group of rocks in Massachusetts..................Bull 86, pp 367–368
island of, age of the sands of the,..............................Bull 84, p 38
new United States...MR 1891, p 69
altitudes in....................Bull 5, pp 169–172; Bull 72, p 225; Bull 76
artesian wells of...Ann 11, II, p 270
boundary lines of, and formation of territory......Bull 13, pp 31, 120–121
brick industry of..................MR 1887, pp 536, 538; MR 1888, p 561
building stone from, statistics of.....................MR 1882, p 451; MR 1888, p 540; MR 1889–90, pp 373, 408–409
coal area and statistics of....Ann 2, p xxviii; MR 1883–84, pp 55–56; MR 1886, p 225; MR 1887, pp 169, 276–277; MR 1888, pp 169, 171, 292; MR 1889–90, pp 147, 231; MR 1891, pp 180, 271
Cretaceous rocks of..................................Bull 82, pp 154, 159
fossils from ....Ann 8, II, pp 901–902
geologic and paleontologic investigations in......Ann 5, p 49; Ann 6, pp 34, 72; Ann 7, pp 80–81, 112, 157; Ann 8, I, p 143; Ann 11, I, p 101
geologic maps of, listed............................Bull 7, pp 113, 114, 115
iron and steel from, statistics of.............MR 1882, pp 120, 125, 133, 134; MR 1885, p 186; MR 1886, p 18
imestone production of..............................MR 1891, pp 464, 466
nineral springs of..Bull 32, p 171; MR 1889–90, pp 522, 529; MR 1891, p 606
ninerals of, the useful..........MR 1882, pp 702–703; MR 1887, pp 755–756
Neocene beds of ....Bull 84, pp 293–299
nd Kansas, the Permian problem of ....Bull 80, pp 193–212
anic, in northwestern New Mexico...................Ann 6, pp 167–178
of the Equus fauna ....Mon I, pp 393–402
nerican and exotic, correlation of.........................Bull 84, p 178

Neocene, Dinocerata from the .... Ann 5, pp 252–254; Mon x, pp 6–7
Neocene formations of America, correlation of the .... Bull 84
Neocene formations of the Atlantic coast, table showing the vertical range of the .... Bull 84, p 193
Neocene in Alabama, Georgia, etc .... Bull 43
Neocene in Kansas .... Bull 57
Neocene in northwestern Colorado .... Ann 9, pp 690–691
Neocene in the Lassen peak district, California .... Ann 8, i, pp 422–424
Neocene; Lafayette formation, the area, features, history, etc., of the .... Ann 12, i, pp 347–521
Neocene; marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America .... Bull 18
Neocene; Miocene, boundaries of the .... Bull 84, pp 21–22
Neocene; Miocene in California .... Mon xiii, pp 218–219, 461
Neocene; Miocene time in the Grand canyon district, erosion in .... Ann 2, p 67
Neocene, nonmarine fossil Mollusca of the, in North America .... Ann 3, pp 411–486
Neocene of the Coastal plain, stratigraphic characters of the .... Bull 83, pp 39–40
Neocene, Ostreidæ of the, in North America .... Ann 4, pp 312–314
Neocene; Pliocene and post-Pliocene in California .... Mon xiii, pp 219–221, 461
Neocene; Pliocene, boundaries of the .... Bull 84, p 22
Neocene. See, also, Tertiary.
Netherlands, fossil plants of the, literature of the .... Ann 8, ii, pp 777–778
Nevada, altitudes in .... Bull 5, pp 173–181; Bull 76
Nevada, antimony deposits in .... MR 1882, p 438; MR 1883–84, pp 642–643; MR 1889–90, p 141; MR 1891, p 174
Nevada; bluestone, the manufacture of, at Lyon mill, Dayton ... MR 1882, pp 297–305
Nevada, borate fields of, the principal .... MR 1882, pp 567–570
Nevada, borax deposits and statistics of .... MR 1882, pp 567–570, 571–576; MR 1883–84, pp 860, 861–862; MR 1885, pp 491–492; MR 1886, pp 678–680; MR 1889–90, p 494; MR 1891, p 587
Nevada, boundary lines of, and organization of territory ..... Bull 13, pp 31, 125–127
Nevada; Cambrian faunas of North America (fossils largely from Nevada), studies on the .... Bull 30
Nevada, Cambrian rocks of .... Bull 81, pp 156, 158, 159, 160
Nevada; clays from Mill city, analyses of .... Bull 9, p 15
Nevada, cobalt deposits in .... MR 1885, pp 361–362, 364
Nevada; Comstock lode and the Washoe district, geology of the .... Ann 2, pp 293–330; Mon iii and atlas
Nevada; Comstock mining and miners .... Mon iv
Nevada, copper from, statistics of .... Ann 2, p xxix; MR 1882, pp 216, 230; MR 1883–84, pp 329, 342; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84
Nevada; dacite from Washoe, analysis of .... Bull 27, p 65
Nevada; Eureka, silver-lead deposits of .... Mon vii
Nevada; Eureka district, geology of the ...... Ann 3, pp 241–290; Mon xx and atlas
Nevada; Eureka district, mining geology of the .... Ann 4, pp 221–251
Nevada; Eureka district, paleontology of the .... Mon viii
Nevada; Eureka district, rocks of the .... Bull 80, pp 222–223
Nevada, fossils from .... Ann 3, pp 440, 448, 451; Ann 8, ii, p 919; Ann 10, i, pp 572–575, 598–602, 607, 609
Nevada, geologic and paleontologic investigations in ...... Ann 1, pp 32–35, 38, 39–46; Ann 2, pp 15–16, 23–25; Ann 3, pp 19–20, 25–26; Ann 4, pp 16–18, 40, 44–45; Ann 5, pp 31, 32; Ann 7, pp 93, 94, 115
Nevada, geologic maps of, listed .... Bull 7, pp 133, 134, 137, 138
Nevada; glaciers, existing, of the United States .... Ann 5, pp 303–355

Nevada, gold and silver from, statistics of..............................Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104–105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 77, 78, 79

Nevada, incrustations from, analysis of..........................Bull 27, pp 69–70

Nevada, irrigation needs and problems in..........................Ann 11, II, p 235

Nevada, irrigation surveys, engineering, hydrography, segregations, etc., in..........................Ann 10, II, pp viii, 18, 58, 59, 66–67, 87–88, 104–106; Ann 11, II, pp 65–66, 168–183; Ann 12, II, pp 45, 209–212, 325

Nevada; lake Lahontan, a Quaternary lake of northwestern Nevada, geological history of..................................Ann 3, pp 195–235; Mon XI

Nevada, lead from, statistics of..................................MR 1882, p 309; MR 1883–84, pp 412, 416, 418–419; MR 1885, pp 248, 250; MR 1886, p 143; MR 1887, p 104; MR 1888, p 86; MR 1889–90, p 80

Nevada, manganese ore in..........MR 1885, p 349; MR 1886, pp 181, 197; MR 1888, pp 124, 128; MR 1889–90, pp 127, 134; MR 1891, pp 127, 136

Nevada; marl from Pyramid lake, analysis of............................Bull 9, p 14

Nevada, mineral springs of..................Bull 32, pp 197–202; MR 1883–84, p 983

Nevada, minerals of, the useful................MR 1882, p 772; MR 1887, pp 756–757

Nevada, natural soda in...Bull 60, pp 46–53

Nevada, Neocene beds of..Bull 84, pp 313–316

Nevada; Nevada limestone at Eureka ....Mon XX, pp 63–68

Nevada, nickel ore in....................MR 1883–84, pp 537, 539; MR 1889–90, p 124

Nevada; on the development of crystallization in the igneous rocks of Washoe, Nevada, with notes on the geology of the district..................Bull 17

Nevada; on the Quaternary and recent Mollusca of the Great basin, with descriptions of new forms, introduced by a sketch of the Quaternary lakes of the Great basin..Bull 11

Nevada; rhyolite from Washoe, analysis of..............................Bull 27, p 66

Nevada, salt from, statistics of.............MR 1882, pp 532–534, 543–547; MR 1883–84, pp 827, 847–848; MR 1885, pp 474, 483; MR 1886, pp 628, 638; MR 1887, p 611; MR 1888, pp 597, 598; MR 1889–90, p 182; MR 1891, p 572

Nevada, soda, carbonate and nitrate of, from....................MR 1882, pp 599, 601

Nevada, sulphur production of....................................MR 1882, p 578; MR 1883–84, pp 865–866; MR 1885, p 496; MR 1886, p 644

Nevada; thinolite of lake Lahontan, a Quaternary lake, crystallographic study of the...Bull 12

Nevada, topographic work in.........Ann 1, p 36; Ann 2, p 21; Ann 4, pp 16, 20–21; Ann 10, II, pp 18, 66–67; Ann 11, II, pp 294–296; Ann 12, I, p 45

Nevada, waters from localities in, analyses of ....Mon XI, p 225; Bull 9, pp 19–26

Nevada-California, reservoir sites and irrigable lands in, reported by topographers ....Ann 11, II, pp 297–298, 310

Nevadite from Chalk mountain, Colorado, description of ....Mon XII, pp 345–349

New Brunswick, literature of the lower Cambrian in ....Ann 10, I, pp 529–531, 544

New Brunswick; review of the fauna of the St. John formation contained in the Hartt collection at Cornell university ....Bull 10, pp 9–42

New Caledonia, nickel production of......MR 1882, pp 406–407; MR 1885, pp 299–301

New Hampshire, altitudes in ....Bull 5, pp 182–186; Bull 76

New Hampshire, boundary lines of.................................Bull 13, pp 40–44

New Hampshire, brick industry of. MR 1887, pp 536, 538; MR 1888, p 561; MR 1891, 502

New Hampshire, building stone from, statistics of.........MR 1882, p 451; MR 1887, p 514; MR 1888, pp 536, 539; MR 1889–90, pp 374, 409; MR 1891, pp 457, 459

New Hampshire, Cambrian rocks of, correlation of the .....Bull 81, pp 70–72, 267, 268

New Hampshire, copper mining and statistics of.......................Ann 2, p xxix; MR 1882, p 230; MR 1883–84, p 329; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84

New Hampshire, corals in .... Bull 80, p 243
New Hampshire, geologic investigations in .... Ann 6, p 24; Ann 7, p 157; Ann 8, I, p 126; Ann 12, I, pp 66–67
New Hampshire, geologic maps of, listed .... Bull 7, pp 54, 56, 57
New Hampshire, gold and silver from, statistics of .... Ann 2, p 385; MR 1882, pp 176, 177, 178
New Hampshire, iron and steel from, statistics of .... MR 1882, pp 120, 125, 133, 134, 135; MR 1886, p 17; MR 1887, p 11; MR 1888, p 14; MR 1891, p 61
New Hampshire, mica production of .... MR 1888, p 614
New Hampshire, mineral springs of .... Bull 32, pp 17–18; MR 1883–84, p 983; MR 1885, p 539; MR 1886, p 717; MR 1887, p 684; MR 1888, p 627; MR 1889–90, pp 522, 529; MR 1891, pp 603, 606
New Hampshire, minerals of, the useful.... MR 1882, pp 703–706; MR 1887, pp 757–760
New Hampshire, pyrites from, statistics of .... MR 1883–84, pp 877–878; MR 1885, pp 501–502; MR 1886, pp 652–653
New Hampshire, topographic work in .... Ann 9, p 76; Ann 10, I, p 85
New Idria mine, California, age of ore deposits of the........ Mon XIII, p 307
New Jersey, altitudes in........ Bull 5, pp 187–191; Bull 76
New Jersey, boundary lines of........ Bull 13, pp 76–78
New Jersey, building stone from, statistics of........ MR 1882, pp 451, 452; MR 1888, pp 536, 544; MR 1889–90, pp 373, 410; MR 1891, pp 457, 459, 461, 463, 464, 466
New Jersey, Cambrian rocks of........ Bull 81, pp 122–123, 154, 287, 382
New Jersey, clay, brick, and pottery industry of .... MR 1882, pp 465, 469, 471–472; MR 1883–84, pp 686–687, 696, 699, 700; MR 1885, pp 416, 418; MR 1886, p 569; MR 1887, pp 536, 538, 540; MR 1888, pp 561–562, 566; MR 1891, p 593
New Jersey, Cretaceous and Tertiary formations of, sketch of the geology of the........ Mon IX, pp ix–xiii
New Jersey, Cretaceous rocks of, correlation of the........ Bull 82, pp 78–84, 214–215
New Jersey, Eocene formations in .... Bull 83, pp 40–43, 80, 85
New Jersey; fossil fishes and fossil plants of the Triassic rocks of New Jersey and the Connecticut valley........ Mon XIV
New Jersey, fossils from. Ann 4, pp 293, 296, 299, 301, 303, 313, 314; Ann 8, II, pp 860–862
New Jersey, geologic and paleontologic investigations in........ Ann 6, p 24; Ann 8, I, p 130; Ann 9, pp 122, 124, 126, 131; Ann 12, I, pp 53, 54, 69–70
New Jersey, geologic maps of, listed .... Bull 7, pp 58, 60, 61, 62, 63
New Jersey, glacial investigations in...... Ann 3, pp 346, 368–369; Ann 7, pp 157, 161
New Jersey, granite production of .... MR 1891, pp 457, 459
New Jersey, iron and steel from, statistics of.. Ann 2, p xxviii; MR 1882, pp 117, 120, 125, 129, 130, 133, 134, 135, 136, 137; MR 1883–84, pp 252, 274–275; MR 1885, pp 182, 184, 186, 188; MR 1886, pp 14, 18, 50–52; MR 1887, pp 11, 16, 44; MR 1888, pp 14, 17, 23; MR 1889–90, pp10, 12, 17; MR 1891, pp 12, 26, 54, 55, 61
New Jersey, lime production of........ MR 1888, p 556
New Jersey; limestone from Hunterdon county, analysis of....... MR 1889–90, p 410
New Jersey, limestone production of........ MR 1891, pp 464, 466
New Jersey, manganese in zinc ores of........ MR 1885, pp 336–341
New Jersey, marl deposits of...... MR 1882, pp 522, 525, 526; MR 1883–84, p 808; MR 1885, p 464; MR 1886, p 619; MR 1887, p 592; MR 1888, p 595; MR 1889–90, p 454
New Jersey, metallic paint production of........ MR 1891, p 597
New Jersey, mineral springs of........ Bull 32, pp 42–43; MR 1889–90, p 530
New Jersey, minerals of, the useful........ MR 1882, pp 706–708; MR 1887, pp 760–762
New Jersey, Neocene beds in........ Bull 84, pp 39–44
New Jersey, Newark system in........ Bull 85, pp 20–21, 83–84
New Jersey, Newark system in, the relations of the traps of the........ Bull 67
New Jersey; nickel works at Camden........ MR 1883–84, p 537; MR 1885, p 297

New Jersey, ocher production in .... MR 1891, p 595
New Jersey; pyroxene and serpentine from Montville, description and analyses of .... Bull 60, p 137
New Jersey, Raritan clays and greensand marls of, Brachiopoda and Lamellibranchiata of the .... Mon IX
New Jersey, Raritan clays and greensand marls of, Gasteropoda and Cephalopoda of the .... Mon XVIII
New Jersey, sandstone production of .... MR 1891, pp 461, 463
New Jersey, slate production of .... MR 1891, p 472
New Jersey surveyed by coöperation of the state .... Ann 6, pp 5–7
New Jersey, topographic work in .... Ann 6, pp 5–7; Ann 7, pp 48–49; Ann 8, I, pp 99–100; Ann 9, p 52
New Jersey; willemite from the Trotter mine, Franklin, description and analysis of .... Bull 60, p 130
New Jersey, zinc and zinc works in .... Ann 2, p xxix; MR 1882, pp 360–361, 373; MR 1883–84, p 476
New Mexico, altitudes in .... Bull 5, pp 192–202; Bull 76
New Mexico; alum rock, so-called, from Grant county, analyses of .... Bull 9, p 13
New Mexico; basalt from six miles northeast of Grant, analysis of .... Bull 42, p 140
New Mexico, boundary lines of, and formation of territory .... Bull 13, pp 31, 123–124
New Mexico, cement, hydraulic, statistics of the production of, in .... MR 1891, p 532
New Mexico, clay, brick, and pottery industry of .... MR 1891, p 525
New Mexico, coal area and statistics of .... MR 1882, pp 62–65; MR 1883–84, pp 12, 56–59; MR 1885, pp 11, 40–41; MR 1886, pp 225, 230, 288–289; MR 1887, pp 169, 278–279; MR 1888, pp 169, 171, 292–294; MR 1889–90, pp 147, 231–233; MR 1891, pp 180, 271–274
New Mexico coals, analyses of .... MR 1889–90, pp 232, 233
New Mexico, coke in, the manufacture of .... MR 1883–84, p 170; MR 1885, pp 80, 93; MR 1886, pp 378, 384, 402; MR 1887, pp 383, 389, 406; MR 1888, pp 395, 400, 412–413; MR 1891, pp 360, 361, 366, 383
New Mexico, copper from, statistics of .... Ann 2, p xxix; MR 1882, pp 216, 225–226; MR 1883–84, pp 329, 340; MR 1885, p 210; MR 1886, p 112; MR 1887, pp 69, 76; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83–84
New Mexico, Cretaceous rocks of .... Bull 82, pp 149, 154–155, 157, 161, 164, 226–227
New Mexico, eruptive rocks from, analyses of .... Bull 27, pp 64–65
New Mexico, fossils from .... Ann 4, pp 297, 302, 304, 306; Ann 8, II, pp 914–916; Bull 34, pp 21, 26, 27
New Mexico, geologic and paleologic investigations in .... Ann 6, p 61; Ann 11, I, pp 97–98, 107, 114, 126
New Mexico, geologic maps of, listed .... Bull 7, pp 140, 141, 142, 143
New Mexico, gold and silver from, statistics of .... Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104–105; MR 1887, pp 58–59; MR 1888, pp 36–37; MR 1889–90, p 49; MR 1891, pp 75, 76, 77, 78, 79
New Mexico, iron in .... MR 1882, pp 147–148; MR 1883–84, pp 285–286; MR 1889–90, pp 24, 40; MR 1891, pp 12, 27
New Mexico, irrigation surveys, engineering, hydrography, segregations, etc., in .... Ann 10, II, pp viii, 19, 58, 63–64, 72–74, 87, 98–102; Ann 11, II, pp 145–150; Ann 12, II, pp 165–209, 251–290
New Mexico; latitudes and longitudes of certain points in Missouri, Kansas, and New Mexico .... Bull 49
New Mexico, lead deposits in .... MR 1882, p 313; MR 1883–84, pp 416, 425; MR 1885, pp 248, 258; MR 1886, p 146; MR 1887, p 110; MR 1888, p 89; MR 1889–90, p 80
New Mexico, limestone production of .... MR 1891, pp 464, 466

New Mexico; mica andesite from a canyon on the east side of San Mateo mountain, analysis of..Bull 42, p 139

New Mexico, mineral springs of..................................Bull 32, pp 193-195; MR 1889-90, p 530; MR 1891, pp 603, 606

New Mexico, minerals of, the useful.......MR 1882, pp 756-758; MR 1887, pp 762-765

New Mexico; mount Taylor and the Zuñi plateau................Ann 6, pp 105-198

New Mexico, Neocene beds of...Bull 84, pp 301-305

New Mexico; on a group of volcanic rocks from the Tewan mountains, and on the occurrence of primary quartz in certain basalts..................Bull 66

New Mexico, Permian rocks in.......................................Bull 80, pp 199-200

New Mexico, petroleum found in..................MR 1882, p 212; MR 1889-90, p 365

New Mexico; picrallumogene from vicinity of Las Vegas, analysis of...Bull 78, p 121

New Mexico, reservoir sites and irrigable lands in, reported by topographers....Ann 11, II, pp 308, 310

New Mexico; rocks from the Tewan mountains, analyses of ....Bull 60, p 155

New Mexico, topographic work in..................................Ann 3, pp 30-40; Ann 4, pp 11-12; Ann 5, pp 11-12; Ann 7, p 57; Ann 9, p 58; Ann 10, I, p 97; II, pp 19, 72-74; Ann 11, II, pp 306-308; Ann 12, I, p 48

New Mexico, turquoise from.................Bull 42, pp 39-44; MR 1882, pp 493-495

New Mexico; water from a spring near Fort Wingate, analysis of........Bull 55, p 92

New Mexico; water from mineral spring one mile west of Santa Fé, analysis of..Bull 27, p 76

New Mexico and Colorado, Rio Grande basin in, irrigation problems relating to the ....Ann 11, II, pp 215-227

New South Wales, antimony production of.........................MR 1883-84, p 648

New South Wales, manganese production of ....MR 1886, p 207

New South Wales, tin production of........................MR 1883-84, pp 619-620

New York, altitudes in ....Bull 5, pp 203-222; Bull 76

New York, boundary lines of, and cession of territory to general government by ....Bull 13, pp 25, 71-76

New York, building stone from, statistics of ....MR 1882, pp 451, 452; MR 1883-84, pp 171, 518; MR 1888, pp 536, 540, 541, 544; MR 1889-90, pp 373, 411-414; MR 1891, pp 457, 459, 461, 463, 464, 466, 468, 469

New York; Cambrian faunas of North America, studies on the (fossils, largely from New York) ....Bull 30

New York, Cambrian, lower, in, literature and fauna of the...............Ann 10, I, pp 534-536, 541-542, 570, 583-584

New York, Cambrian rocks of ....Bull 81, pp 109, 311, 381

New York, cement manufacture in..................................MR 1882, p 460; MR 1883-84, p 671; MR 1886, p 556; MR 1887, p 527; MR 1888, p 551; MR 1889-90, p 461; MR 1891, pp 532, 536

New York, clay, brick, and pottery industry of............MR 1883-84, pp 695, 709; MR 1885, p 416; MR 1886, p 568; MR 1887, pp 536, 539; MR 1888, pp 562, 566

New York; Cretaceous deposits of Staten island and Long island...Bull 82, pp 84-86

New York, Devonian, upper, in, fossil faunas of the ....Bull 3; Bull 41

New York; dolomite from Tuckahoe, analyses of ....Bull 60, p 159

New York, dumortierite from ....Bull 60, pp 133-135

New York; faunas, the fossil, of the upper Devonian along the meridian of 76° 30′ from Tompkins county, New York, to Bradford county, Pennsylvania..Bull 3

New York; faunas, the fossil, of the upper Devonian, the Genesee section, New York ....Bull 41

New York; faunas, the higher Devonian, of Ontario county, New York......Bull 16

New York, fossils from ....Ann 8, II, pp 854-859; Ann 10, I, pp 572-575, 601-658; Mon XVI, pp 20-115

rk, geologic and paleontologic investigations in..................Ann 3, p 20; Ann 4, p 25; Ann 5, pp 52, 54; Ann 6, pp 24, 28, 32, 74, 75; Ann 7, pp 65, 83, 85, 113, 114–115; Ann 8, I, pp 128, 130, 174, 175, 176; Ann 9, pp 71, 77, 105, 115, 116, 117, 122; Ann 10, I, p 160; Ann 11, I, pp 103, 104, 114; Ann 12, I, pp 107, 121
rk, geologic maps of, listed ....Bull 7, pp 58, 59, 60, 62, 63
rk, glacial investigations in ....Ann 3, pp 344, 346, 348–350, 353–377; Ann 7, pp 157, 166, 171
rk, granite production of.................................MR 1891, pp 457, 459
rk, graphite mined in..................................MR 1882, pp 591–592; MR 1883–84, pp 915, 916; MR 1887, p 672; MR 1889–90, p 507
rk, gypsum production of...............................MR 1891, pp 580, 581
rk; hornblende from Pierrepont, analyses of ....Bull 78, p 119
rk; inclusion in diorite from near Peekskill, analysis of.......Bull 60, p 158
rk, iron and steel from, statistics of..............Ann 2, p xxviii; MR 1882, p 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, pp 252, 271–274; MR 885, pp 182, 184, 186, 188; MR 1886, pp 14, 18, 43–50; MR 1887, pp 11, 16, 43–44; IR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 12, 17; MR 1891, pp 12, 21, 54, 55, 61
k, lime production of ....MR 1887, p 533; MR 1888, p 556
k, limestone production of ....MR 1891, pp 464, 466
k, marble production of................................MR 1891, pp 468, 469
k, metallic paint production of..............................MR 1891, p 597
k, mineral springs of.......................................Bull 32, pp 26–41; MR 1883–84, p 983; MR 1885, p 539; MR 1886, p 717; MR 1887, p 685; MR 1888, p 627; MR 1889–90, p 530; MR 1891, pp 603, 606
k, minerals of, the useful ....MR 1882, pp 708–713; MR 1887, pp 765–769
k, mining laws of...MR 1886, pp 732–734
k, natural gas localities and statistics of...........MR 1883–84, pp 236, 243; MR 1885, pp 169, 174; MR 1886, p 490; MR 1887, pp 466, 474–479; MR 1888, p 489; MR 1889–90, p 367; MR 1891, pp 438, 439, 440
k, petroleum localities and statistics of ....MR 1882, pp 190, 199–202; MR 1883–84, pp 214–215, 221–224; MR 1885, pp 131–145; MR 1886, pp 441, 442–457; MR 1887, pp 438, 439–450; MR 1888, pp 444, 445–459; MR 1889–90, pp 292, 297–318; MR 1891, pp 412–426
k, pyrites from, statistics of..................................MR 1885, p 504
k, rocks of, their classification, etc...............................Bull 80, pp 32–34, 38–40, 42–43, 45–46, 48–74, 260, 266
k; salt from Warsaw, analysis of.................................Bull 55, p 88
k, salt-making in ....Ann 7, pp 504, 505, 506, 507, 510
k, salt from, statistics of...MR 1882, pp 532–534, 537–539; MR 1883–84, pp 827, 830–835; MR 1885, pp 474, 476–479; MR 1886, pp 628, 632–636; MR 1887, pp 611, 614–617; MR 1888, pp 597–598, 600–603; MR 1889–90, pp 482, 484–487; MR 1891, pp 575–576
k, sandstone production of................................MR 1891, pp 461, 463
k; sea-coast swamps of eastern United States.............Ann 6, pp 353–398
k, slate production of.....................................MR 1891, pp 472–473
k, talc production and industry of..MR 1885, pp 534–535; MR 1889–90, p 476
k, topographic work in...Ann 10, I, pp 85, 86, 87, 89; Ann 11, I, p 36; Ann 12, I, p 26
; warwickite from Edenville, Orange county, analysis of ....Bull 64, p 41
-Virginia area of the Newark system................Bull 85, pp 20–21, 83–85
and, fossil plants of, literature of the ....Ann 8, II, pp 815–817
and, geyserites from, analyses of...............................Bull 64, p 45
and, manganese production of.......................................MR 1886, p 207; MR 1888, p 142; MR 1889–90, p 130; MR 1891, p 145
and, petroleum production of.................................MR 1888, p 473

New Zealand, quicksilver deposits in .... Mon XIII, p 49
New Zealand sinters and spring waters........ Ann 9, pp 672–676
New Zealand, waters from springs of, analyses of .... Ann 9, p 673
Newark system, a correlation essay on the, by I. C. Russell .... Bull 85
Newark system, areas occupied by the .... Bull 85, pp 19–24
Newark system in the New Jersey region, the relations of the traps of the... Bull 67
Newark system, lithology and stratigraphy of the........ Bull 85, pp 32–44
Newark system. See, also, Jura-trias.
Newberry (J. S.), administrative report for 1887–88........ Ann 9, pp 131–132
Newberry (J. S.), administrative report for 1888–89........ Ann 10, I, pp 174–175
Newberry (J. S.), biographic sketch of .... Ann 5, pp 381–382
Newberry (J. S.), fossil fishes and fossil plants of the Triassic rocks of New Jersey and the Connecticut valley .... Mon XIV
Newberry (J. S.), Paleozoic fishes of North America........ Mon XVI
Newberry (S. B.), natural and artificial cements .... MR 1891, pp 529–538
Newberry (S. B.), product of hydraulic and Portland cement in the United States in 1890 and 1891 .... MR 1889–90, pp 461–462
Newell (F. H.), administrative report for 1890–91 .... Ann 12, I, pp 134–136
Newell (F. H.), hydrography of the arid regions of the U. S.... Ann 12, II, pp 213–361
Newfoundland, Cambrian, lower, in, literature and fauna of the........ Ann 10, I, pp 528–529, 586
Newfoundland, Cambrian rocks of, investigations of the........ Bull 81, pp 50–55, 78–80, 253–262, 380, 406–407
Newfoundland, copper production of .... MR 1883–84, pp 356, 373; MR 1885, p 229; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1891, pp 101, 102
Newfoundland; geologic section on Manuel's brook, Conception bay.. Ann 10, I, p 554
Newfoundland, geologic maps of, list of the .... Bull 7, pp 36–38
Newfoundland, pre-Cambrian rocks of .... Bull 86, pp 247–252, 503
Newfoundland, pyrites deposits in........ MR 1883–84, p 507
Newfoundland, submarine strata off........ Bull 84, p 32
Newfoundland. See, also, Canada.
Niagara falls, survey of, by R. S. Woodward, in 1886........ Ann 8, I, p 122
Nickel from foreign localities .... MR 1882, pp 405–407, 410–411; MR 1883–84, pp 539–540; MR 1885, pp 299–301; MR 1889–90, p 125
Nickel ore, platiniferous, from mines at Sudbury, Canada........ Bull 64, pp 20–21
Nickel ores, analyses of........ Bull 64, pp 20, 21; MR 1882, pp 404, 406
Nickel ores at Sudbury, Can., mode of occurrence, treatment, etc. MR 1888, pp 110–117
Nickel ores from Oregon, descriptions and analyses of........ Bull 60, pp 21–26
Nickel, statistics of .... MR 1882, pp 399–420; MR 1883–84, pp 537–543; MR 1885, pp 297–302; MR 1886, pp 169–173; MR 1887, pp 126–129; MR 1888, pp 108–118; MR 1889–90, pp 124–126; MR 1891, pp 167–169
Niobrara group of rocks of Nebraska .... Bull 84, pp 293–296
Niter from Utah, analysis of........ Bull 55, p 88
Niter, statistics of .... MR 1882, pp 597–598
Nitrogen in uraninite, the occurrence of, and the composition of uraninite in general........ Bull 78, pp 43–79
Nodules resulting from external attack .... Mon XIII, pp 68–72
Nomenclature and classification of fossil plants .... Ann 5, pp 425–439
Nomenclature and taxonomy, geologic, conference of geologists and lithologists on, in January, 1889 .... Ann 10, I, pp 56–67
Nomenclature, general geologic .... Ann 2, pp xli–xlvii
Nomenclature of pre-Cambrian .... Bull 86, p 191
Nomenclature. See, also, Correlation.
Nonabsorption of sedimentary rocks by eruptive masses........ Mon XII, pp 308–313
Nonconformity. See Unconformity.

Norian terrane defined .... Bull 86, p 462
Norite from Delaware described .... Bull 59, p 21
North America, fossil plants of, literature of the .... Ann 8, II, pp 835–926
North America, geological maps of, a list of the .... Bull 7, pp 23–32, 159–160
North Carolina, altitudes in .... Bull 5, pp 223–226; Bull 76
North Carolina, barytes production of .... MR 1891, p 599
North Carolina, boundary lines of, and cession of territory to general government .... Bull 13, pp 92–96
North Carolina, brick industry of .... MR 1888, pp 562, 566
North Carolina, building stone from, statistics of .... MR 1889–90, pp 374, 414–415; MR 1891, pp 457, 459, 461, 463, 470
North Carolina, Cambrian rocks of .... Bull 81, pp 138–139, 299, 383
North Carolina, clay production of .... MR 1891, p 505
North Carolina, coal areas and statistics of .... Ann 2, p xxviii; MR 1883–84, p 59; MR 1885, pp 41–43; MR 1887, pp 169, 279–281; MR 1888, p 169; MR 1889–90, pp 146, 234; MR 1891, pp 180, 274
North Carolina, coals from, analyses of .... Bull 42, p 146
North Carolina, copper mines and statistics of .... Ann 2, p xxix; MR 1882, p 231
North Carolina, corundum deposits and statistics of .... MR 1882, p 477; MR 1883–84, pp 715–716; MR 1885, p 429; MR 1886, pp 585–586; MR 1887, p 553; MR 1888, p 577
North Carolina; Corundum hill, the gneiss dunyte contacts of, in relation to the origin of corundum .... Bull 42, pp 45–63
North Carolina, Cretaceous deposits of .... Bull 82, pp 91–92
North Carolina; Dismal swamp district of Virginia and North Carolina, geology of the .... Ann 10, I, pp 313–339
North Carolina, Eocene deposits in .... Bull 83, pp 48–50, 81, 87
North Carolina, emeralds in, the discovery of .... MR 1882, pp 500–503
North Carolina, fertilizer trade in, in 1886 .... MR 1886, pp 611–617
North Carolina, fossils from .... Ann 8, II, pp 877–878
North Carolina, geologic and paleontologic investigations in .... Ann 6, p 24; Ann 7, p 66; Ann 8, I, p 129; Ann 10, I, pp 118, 120, 155, 174; Ann 11, I, p 69; Ann 12, I, pp 75, 114, 117
North Carolina, geologic maps of, listed .... Bull 7, pp 102, 103, 109, 167
North Carolina, gold and silver from, statistics of .... Ann 2, p 385; MR 1882, pp 172, 176, 177, 178; MR 1883–84, pp 312, 313; MR 1885, p 201; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 77, 78, 79
North Carolina, granite production of .... MR 1888, p 539; MR 1891, pp 457, 459
North Carolina, graphite deposits of .... MR 1887, p 672
North Carolina, iron and steel from, statistics of .... Ann 2, p xxviii; MR 1882, pp 120, 129, 131; MR 1883–84, pp 252, 277–278; MR 1885, p 182, 188; MR 1886, pp 14, 18, 33, 82–83; MR 1887, pp 11, 16; MR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 17; MR 1891, pp 12, 27, 54, 55
North Carolina, manganese ore in .... MR 1885, p 344; MR 1886, p 181; MR 1886, pp 190–193; MR 1887, pp 145, 151; MR 1888, pp 124, 129–130; MR 1889–90, pp 127, 134; MR 1891, pp 127, 136
North Carolina, marl deposits of .... MR 1886, p 619; MR 1888, p 595
North Carolina, Mesozoic flora of, the older .... Mon VI, pp 97–128
North Carolina, meteoric iron from, description and analysis of .... Bull 78, pp 93–94
North Carolina, mica mining in .... MR 1887, pp 661–671
North Carolina, mica production of .... MR 1882, p 583; MR 1883–84, pp 908–909; MR 1885, pp 518, 519; MR 1887, p 660; MR 1888, p 614; MR 1889–90, p 474

North Carolina, mineral springs of....................Bull 32, pp 74–78; MR 1883–84, p 984; MR 1885, p 539; MR 1886, p 718; MR 1887, p 685; MR 1888, p 628; MR 1889–90, pp 530–531; MR 1891, pp 603, 607
North Carolina, minerals of...Bull 74
North Carolina, minerals of, the minor..........................MR 1882, pp 659–661
North Carolina, minerals of, the useful....MR 1882, pp 713–718; MR 1887, pp 769–774
North Carolina, Neocene beds of...................................Bull 84, pp 68–74
North Carolina, Newark system in..........................Bull 85, pp 23–24, 95–97
North Carolina, nickel deposits in..................................MR 1886, p 170; MR 1889–90, p 125; MR 1891, p 168
North Carolina; oligoclase from Bakersville, description and analysis of......Bull 60, pp 129–130
North Carolina, phosphate deposits of........Bull 46, pp 70–75; MR 1883–84, pp 788–793; MR 1885, pp 449–450; MR 1888, p 592
North Carolina, precious stones mined for in...........MR 1882, p 483; MR 1883–84, pp 724, 729, 733–734, 739; MR 1885, p 437; MR 1886, p 595
North Carolina, pyrites from, statistics of..........................MR 1885, p 505
North Carolina; residual deposit from subaërial decay of chloritic schist from eight miles west of Cary, analysis of...........................Bull 42, p 137
North Carolina, slate found in.......................................MR 1891, p 473
North Carolina, topographic work in.....Ann 4, pp 13–15; Ann 5, pp 4–5; Ann 6, pp 8, 9; Ann 7, p 52; Ann 8, I, p 102; Ann 9, pp 54, 55; Ann 10, I, p 90; Ann 11, I, p 38
North Carolina; trap, decomposed, from near Sanford, analysis of ....Bull 42, p 138
North Carolina; water from Lincoln county, analysis of..............Bull 60, p 171
North Carolina; websterite from Webster, analyses of.................Bull 78, p 122
North Carolina; xanthitane from Green river ....Bull 60, p 135
North Carolina, zirconium deposits in..................................MR 1885, p 393
North Dakota. See Dakotas.
Northwest territories, geological maps of the, list of the..........Bull 7, pp 117–121
Northwest territory, fossil plants of the, literature of the......Ann 8, II, pp 838–842
Northwest territory. See, also, Canada.
Norway, copper production of....MR 1883–84, p 356; MR 1885, p 228; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1889–90, p 73; MR 1891, pp 100, 102
Norway, fauna of the Olenellus zone in ....Ann 10, I, p 579
Norway, fossil plants of, literature of the......................Ann 8, II, pp 778–779
Norway, phosphate deposits of....................................Bull 46, pp 42–45
Norway, silver production of, compared with that of other countries....MR 1883–84, pp 319, 320
Nova Scotia, coal area and output of, compared with those of other countries.............MR 1882, p 5; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189
Nova Scotia, gypsum deposits of ....MR 1883–84, p 809; MR 1885, pp 459–460; MR 1887, pp 602, 603
Nova Scotia. See, also, Canada.
Novaculite from Marquette, Michigan, analysis of......................Bull 60, p 151
Novaculite, statistics of.......................MR 1882, p 492; MR 1885, pp 433–436; MR 1886, pp 589–594; MR 1887, p 553; MR 1889-90, p 460
Obsidian, analyses of...Ann 7, pp 282, 291
Obsidian, andesitic, described.................................Mon XIII, pp 153–154
Obsidian, basaltic, described ....Mon XIII, pp 158–161
Obsidian, columnar structure in ....Ann 7, p 257
Obsidian, scoriaceous, from Mono valley, California, analysis of.........Bull 9, p 14
Obsidian cliff, Yellowstone national park ....Ann 7, pp 249–295
Ocala limestone of Florida ....Bull 84, pp 103–104
Ocean waters, general chemistry of ....Mon XI, pp 178–181
Ocher, statistics of....................MR 1889-90, pp 508–509; MR 1891, pp 595–596
Odontornithes, classification of the subclass ....Ann 3, p 86

d Weber rivers, Utah, hydrography of .... Ann 12, ii, p 334

itudes in .... Bull 5, pp 227–240; Bull 76

esian wells in .... Ann 11, ii, p 263

rea grit or sandstone from, analysis of .... Bull 60, p 158

rea grit or sandstone from, statistics of ..... MR 1882, p 478; MR 1886, p 583

e sandstone, analysis of .... Bull 27, p 66

ndary lines of, and formation of, from territory northwest of Ohio er .... Bull 13, pp 28, 110–111

mine industry of .... MR 1883–84, pp 851–852; MR 1885, p 487; MR 1886, p 642; MR 1887, pp 626, 627; MR 1888, p 613; MR 1889–90, p 493; MR 1891, p 579

lding stone from, statistics of .... MR 1882, p 451; MR 1886, p 540; MR 1887, pp 516–517, 521; MR 1888, pp 540, 545; MR 1889–90, pp 373, 415–417; MR 1891, pp 461, 463, 464, 467

ent production of .... MR 1889–90, p 461; MR 1891, pp 532, 536

y, brick, and pottery industry of .... MR 1882, pp 466, 470; MR 1883–84, pp 681, 684, 685–686, 693; MR 1885, pp 416, 418; MR 1886, pp 568–569; MR 1887, pp 536, 539, 540; MR 1888, pp 562–563, 566; MR 1891, p 509

l area and statistics of .... Ann 2, p xxviii; MR 1882, pp 65–66; MR 1883–84, pp 12, 59, 66; MR 1885, pp 11, 43–45; MR 1886, pp 224, 230, 289–294; MR 1887, pp 169, 171, 281–288; MR 1888, pp 169, 171, 294–301; MR 1889–90, pp 147, 235–240; MR 1891, pp 180, 275, 287

e in, the manufacture of .... MR 1883–84, pp 171–175; MR 1885, pp 80, 93–96; MR 1886, pp 378, 384, 403–408; MR 1887, pp 383, 389, 407–409; MR 1888, pp 395, 400, 413–414; MR 1891, pp 360, 361, 366, 384–386

ils from .... Ann 8, ii, pp 884–891; Mon xvi, pp 27–228

logic and paleontologic investigations in .... Ann 3, pp 20–21; Ann 4, p 25; Ann 5, p 23; Ann 6, pp 35, 36, 74, 75; Ann 7, p 67; Ann 9, p 77; Ann 11, i, p 74; Ann 12, i, p 89

logic maps of, listed .... Bull 7, pp 77, 78, 80, 81, 82, 83, 84, 85, 86, 87

cial boundary in western Pa., Ohio, Ky, Ind., and Ill .... Bull 58

ial investigations in ..... Ann 3, pp 334, 337, 339–342; Ann 7, pp 157, 227–228

sum deposits and industry of .... MR 1882, p 527; MR 1883–84, p 811; MR 1885, p 462; MR 1886, p 620; MR 1887, pp 596–599; MR 1889–90, p 465; MR 1891, pp 580, 582

and steel from, statistics of .... Ann 2, p xxviii; 1882, pp 120, 125, 129, 130, 131, 132, 133, 134, 135, 136, 137; MR 1883–84, pp 252, -276; MR 1885, pp 182, 184, 186; MR 1886, pp 18, 56–61; MR 1887, pp 11, 16, 46; 1888, pp 14, 17, 23; MR 1889–90, pp 10, 12, 17; MR 1891, pp 12, 26, 54, 55, 61

production of .... MR 1887, p 533; MR 1888, p 556

stones, analyses of .... Bull 55, p 80; MR 1889–90, p 417

stone production of .... MR 1891, pp 464, 467

eral springs of .... Bull 32, pp 130–134; MR 1883–84, p 984; MR 1885, p 539; MR 1886, p 718; MR 1887, p 685; MR 1888, p 628; MR 1891, pp 603, 607

erals of, the useful .... MR 1882, pp 718–721; MR 1887, pp 775–778

ing laws of .... MR 1886, pp 734–740

ral gas localities and statistics of .... MR 1883–84, pp 236, 237, 243; MR 1885, pp 166–167; MR 1886, pp 504–508; MR 1887, pp 466, 479–484; MR 1888, pp 483–485, 489–499; MR 1889–90, p 367; MR 1891, p 438

roleum and inflammable gas in Ohio and Indiana, the Trenton limee as a source of .... Ann 8, ii, pp 475–662

oleum localities and statistics of .... MR 1882, p 189; MR 1883–84, pp 215–216; MR 1885, p 146; MR 1886, pp 441, 458–461; MR 1887, pp 438, 451; MR 1888, pp 444, 459–462; MR 1889–90, pp 292, 318–329; MR 1891, pp 405, 407, 426–431

Ohio, rocks of, their classification, etc .... Bull 80, pp 41, 43, 87, 94, 101–102, 140, 177, 183, 184–189
Ohio, salt-making in .... Ann 7, pp 504, 508, 509, 522, 525
Ohio, salt from, statistics of .... MR 1882, pp 532–534, 541; MR 1883–84, pp 827, 836–839; MR 1885, pp 474, 479; MR 1886, pp 628, 637; MR 1887, pp 611, 618–619; MR 1888, pp 597–598, 604; MR 1889–90, pp 482, 488; MR 1891, p 572
Ohio sandstone, analyses of .... MR 1889–90, p 416
Ohio, sandstone production of .... MR 1891, pp 461, 463
Ohio; stratigraphy of the bituminous coal field in Pennsylvania, Ohio, and West Virginia .... Bull 65
Ohio and Indiana, limestones from, analyses of .... Bull 60, pp 160–162
Oil fields of the United States .... MR 1883–84, pp 214–220
Oil. See, also, Petroleum.
Oilstones and whetstones, statistics of .... MR 1891, pp 553–555
Olenellus Howelli, from the Eureka dist., Nev., observations on .. Mon VIII, pp 30–39
Olenellus shale of Nevada .... Mon XX, pp 45–47
Olenellus zone, bibliography of the rocks and fossils of the .... Ann 10, I, pp 516–524
Olenellus zone, geographic distribution of the fauna of the, in Europe .... Ann 10, I, pp 577–581
Olenellus zone, geographic distribution of the fauna of the, in North America .. Ann 10, I, pp 564–577
Olenellus zone, geologic description of the .... Ann 10, I, pp 547–564
Olenellus zone, historical review of the, for Europe .... Ann 10, I, pp 545–547
Olenellus zone, historical review of the, for North America .... Ann 10, I, pp 524–544
Olenellus zone, notes on the genera and species of the .... Ann 10, I, pp 597–760
Olenellus zone, table of the geographic distribution of the fauna of the, in North America .... Ann 10, I, pp 572–575
Olenellus zone, the lower Cambrian, fauna of the .... Ann 10, I, pp 509–763
Oligocene insects from Colorado and Utah .... Bull 93
Oligoclase from Bakersville, N. C., description and analysis of .... Bull 60, pp 129–130
Olivenite from the Tintic mining district, Utah, descriptions and analyses of ... Bull 20, pp 83–84; Bull 55, pp 39–40
Olivine in basalts of the Eureka district, Nevada .... Mon XX, pp 258–259
Ontario. See Canada.
Oölite from Ireland compared with Kentucky limestone .... MR 1889–90, p 395
Oölitic sand from shore of Great salt lake, analysis of .... Bull 27, p 69
Oölitic sand of lake Bonneville and of Great salt lake .... Mon I, p 169
Opal. See Precious stones.
Optical properties of plagioclase in pyroxene-andesite .... Mon XX, pp 350–354
Oquirrh mountains, Utah, Archean and Algonkian rocks of the .... Bull 86, p 295
Orange sand .... Ann 12, I, pp 498–501
Ore bodies and fissures, connection between .... Mon VII, p 75
Ore bodies and fissures, relative ages of .... Mon VII, p 76
Ore bodies, caves in connection with .... Mon VII, pp 73, 95
Ore bodies, effects of oxidation on the bulk of .... Mon VII, p 100
Ore bodies, electrical activity of .... Ann 2, pp 320–324; Mon III, pp 309–367, 400–404
Ore bodies of New Almaden, California, form of the .... Mon XIII, pp 316–317
Ore bodies of Virginia group of bonanzas in Nevada .... Mon III, pp 275–276
Ore bodies; vein formation, theories of .... Mon III, pp 18–21, 30; Mon VII, pp 80–106, 187–190; Mon XII, p 378; Mon XIII, pp 407–450, 473–475; Mon XX, pp 310–311
Ore deposits, age of .... Mon VII, pp 69, 76
Ore deposits, classification of, according to different authors .... Mon VII, pp 117–119
Ore deposits, fallacies regarding .... Ann 4, pp 257–271
Ore deposits in general, classification of ..... Ann 2, pp 231–233; Mon XII, pp 367–375

Ore deposits of Adams hill, Eureka district, Nevada .... Mon vii, pp 166-167
Ore deposits of Carbonate hill, Leadville, Colorado .... Mon xii, p 411
Ore deposits of Eureka district, Nev., classification of the .... Mon vii, pp 68-69, 184
Ore deposits of Eureka district, Nevada, geology of the .... Mon xx, pp 292-316
Ore deposits of Eureka district, Nevada, theory in regard to the formation of the .... Mon vii, p 80
Ore deposits of Fryer hill, Leadville, Colorado .... Mon xii, p 451
Ore deposits of the Great eastern district, Sonoma co., Cal ..... Mon xiii, pp 363-364
Ore deposits of Leadville, Colorado .... Ann 2, pp 234-239
Ore deposits of New Idria mine, California, age of, etc.... Mon xiii, pp 302-304, 307
Ore deposits of Ten mile district, Colorado .... Mon xii, pp 537-538
Ore deposits; quicksilver ores of California, origin of the .... Mon xiii, pp 261-263, 289-290, 308-309, 327-330, 394-450, 471-475
Ore genesis, theories of .... Mon xiii, pp 442-445, 475
Ore in Prospect mountain, Eureka district, Nevada, source of the..... Mon vii, p 91
Ore of Comstock vein, Nevada, source of the .... Mon iii, p 18
Ore of Eureka district, Nevada, age of the .... Mon vii, p 105
Ore of Eureka district, Nevada, rhyolite as a source of the .... Mon vii, p 90
Ore roasting .... Bull 26, pp 16-18, 22-24, 76
Ore smelting in shaft-furnace process .... Bull 26, pp 76-77
Ores and slags, classification of .... Bull 26, pp 70-73
Ores, chloride, in the Leadville district, Nevada .... Mon xii, pp 548-549
Ores deposited as sulphides .... Mon xii, pp 562-565; Mon xiii, pp 397, 438; Mon xx, pp 310-311
Ores, iron, analyses of .... Bull 42, pp 144-145; Bull 78, pp 125-127
Ores, iron, mode of concentration of .... Ann 10, i, p 417
Ores, iron, of Wisconsin and Michigan .... Ann 10, i, pp 409-422
Ores, mode of formation of .... Mon xii, pp 565-569
Ores of the Comstock mines, Nevada .... Mon iii, pp 218-222
Ores of Eureka district, Nevada; arrangement in chambers .... Mon vii, p 97
Ores of Eureka district, Nevada, comparison of, with deposits of Raibl, Carinthia .... Mon vii, p 103
Ores of Eureka district, Nevada, manner of deposition of the .... Mon vii, pp 93-106, 188
Ores of Eureka district, Nevada, miner's classification of the ..... Mon vii, pp 59-60
Ores of Eureka district, Nevada, occurrence of the .... Ann 4, pp 244-247
Ores of Eureka district, Nevada, reduction of the .... Mon vii, p 158
Ores of Eureka district, Nevada, segregation of the .... Mon vii, pp 87-89
Ores of Eureka dist., Nev., source of the .. Ann 4, pp 247-249; Mon vii, pp 80-92, 187
Ores of Leadville district, Colorado, description and composition of the..... Ann 2, p 235; Mon xii, pp 376-377, 543-548, 616-619
Ores of Leadville dist., Colo., manner of occurrence of..... Mon xii, pp 375, 540-543
Ores of manganese, analyses of .... Bull 78, pp 127-128
Ores of Mosquito range, Colorado, analyses of .... Mon xii, pp 536, 537
Ores of Prospect mountain and Ruby hill, Eureka district, Nevada .... Ann 4, p 250; Mon vii, pp 50-63
Ores of Steamboat springs, California .... Mon xiii, pp 342-343
Ores, pseudomorphism after limestone, evidences of, in .... Mon vii, p 98
Ores, secondary alteration of .... Mon xii, pp 550, 553
Oregon, aboriginal lapidary work in .... MR 1891, p 551
Oregon, altitudes in .... Bull 5, pp 241-244; Bull 72, p 226; Bull 76
Oregon; basalt from mount Thielson, analysis of .... Bull 9, p 15
Oregon; borax deposits at Chetco .... MR 1889-90, pp 504-505
Oregon, boundary lines of, territory formed, state admitted...... Bull 13, pp 31, 128
Oregon; Chico-tejon series in Oregon and Washington territory, the occurrence of equivalents of the .... Bull 51, pp 28-32

Oregon, coal area and statistics of..........Ann 2, p xxviii; MR 1882, pp 94–95; MR 1883–84, pp 12, 66; MR 1885, pp 11, 45; MR 1886, pp 225, 230, 294–295; MR 1887, pp 169, 288–290; MR 1888, pp 170, 171, 301; MR 1888–90, pp 147, 240–241; MR 1891, pp 180, 287
Oregon, Cretaceous rocks of..........Bull 82, pp 181, 183, 184, 187, 194
Oregon, fossils from..........Ann 8, II, pp 922–923
Oregon, geologic and paleontologic investigations in..........Ann 4, p 41; Ann 5, p 49; Ann 6, pp 60, 73; Ann 7, p 102; Ann 8, I, pp 156–164; Ann 10, I, p 145; Ann 12, I, pp 57, 100, 116
Oregon, geologic reconnaissance in southern..........Ann 4, pp 431–464
Oregon; glaciers, existing, of the United States..........Ann 5, pp 303–355
Oregon, gold and silver from, statistics of..........Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 76, 77, 78, 79
Oregon, iron and steel from, statistics of..........Ann 2, p xxviii; MR 1882, pp 120, 129, 131; MR 1883–84, pp 252, 287; MR 1885, p 182; MR 1886, p 18; MR 1888, p 15; MR 1889–90, pp 10, 17; MR 1891, pp 12, 27
Oregon, mineral springs of......Bull 32, pp 215–217; MR 1883–84, p 984; MR 1885, p 540; MR 1886, p 718; MR 1887, p 685; MR 1888, p 628; MR 1889–90, p 531
Oregon, minerals of, the useful..........MR 1882, p 773; MR 1887, pp 778–779
Oregon, Neocene deposits of..........Bull 84, pp 223–227, 280–285
Oregon, nickel ores from..........Bull 60, pp 21–26; MR 1882, pp 403–404; MR 1883–84, pp 537, 539; MR 1887, pp 127–128; MR 1891, p 168
Oregon; on marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America..........Bull 18
Oregon; on the Quaternary and recent Mollusca of the Great basin, with descriptions of new forms; introduced by a sketch of the Quaternary lakes of the Great basin..........Bull 11
Oregon, California, and Washington, Cenozoic epoch in, general considerations on the..........Bull 84, pp 269–273
Oregon, quicksilver production of..........MR 1887, pp 118, 125; MR 1889–90, p 94
Oregon, soda, natural, of Abert and Summer lakes..........Bull 60, pp 53–55
Oregon, Tejon strata of..........Bull 83, p 103
Oregon, topographic work in..Ann 7, p 57; Ann 8, I, p 105; Ann 9, p 59; Ann 10, I, p 97
Oregon; water from Abert lake, analysis of..........Bull 9, p 28
Organic matter an agent in formation of concretions in sandstones..........Mon XIII, pp 64–68
Organic processes of soil formation..........Ann 12, I, pp 268–287
Organization, the business, of the United States Geological Survey..Ann 8, I, pp 3–69
Orogeny. See Diastrophism.
Orthoclase, analyses of..........Mon XII, p 333
Orton (E.), gypsum or land plaster in Ohio..........MR 1887, pp 596–601
Orton (E.), quoted on natural gas in Ohio..........MR 1887, pp 479–484
Orton (E.), the Trenton limestone as a source of petroleum and inflammable gas in Ohio and Indiana..........Ann 8, II, pp 475–662
Osmiridium, analyses of..........MR 1883–84, p 581
Ostreidæ, a review of the fossil, of North America..........Ann 4, pp 273–430
Ostreidæ, Carboniferous, of North America..........Ann 4, p 288
Ostreidæ, Cretaceous, of North America..........Ann 4, pp 290–308
Ostreidæ, Jurassic, of North America..........Ann 4, pp 289, 290
Ostreidæ; life-history of the oyster..........Ann 4, pp 317–333
Ostreidæ, Miocene, of North America..........Ann 4, pp 312–314
Ostreidæ, North American Tertiary..........Ann 4, pp 309–316
Ostreidæ, Oligocene, of North America..........Ann 4, pp 311, 312

Ostreidæ, Pliocene and post-Pliocene, of North America..........Ann 4, pp 314-316
Overplacement..........Ann 12, I, pp 296-300
Owen's lake, California, analysis of water from..........Ann 8, I, p 295; Bull 55, p 93
Owyhee river basin, Oregon, hydrography of..........Ann 11, II, pp 85-86, 106
Oxide films on steel, relation between time of exposure, temper-value, and color in..........Bull 27, pp 51-61
Oyster, life-history of the..........Ann 4, pp 317-333
Ozocerite, statistics of..........MR 1882, p 609; MR 1883-84, pp 955-957; MR 1888, p 515; MR 1889-90, p 481
Pachnolite from near Pike's peak, Colo., description, etc., of..........Bull 20, pp 49-55
Pacific coast, invertebrate fossils from the..........Bull 51
Pacific coast, mineralogy of the, contributions to the..........Bull 61
Pacific coast. See, also, California; Oregon; Washington.
Pacific slope, quicksilver deposits of the..........Ann 8, II, pp 961-985
Packard (R. L.), aluminum, statistics of..........MR 1882, p 445; MR 1883-84, pp 658-660; MR 1885, pp 390-392; MR 1886, pp 220-221; MR 1887, pp 138-141; MR 1888, pp 160-164; MR 1889-90, pp 110-118; MR 1891, pp 147-163
Pahoehoe lava, character of..........Ann 4, p 95
Paints, mineral, analyses of..........MR 1885, pp 528, 530, 531
Paints, mineral, statistics of..........MR 1883-84, pp 920-929; MR 1885, pp 524-533; MR 1886, pp 702-714; MR 1887, pp 674-679; MR 1888, pp 616-622; MR 1889-90, pp 508-512; MR 1891, pp 595-598
Paleobotanists, biographical sketches of..........Ann 5, pp 369-385
Paleobotany, classification in, the natural method of..........Ann 5, pp 431-452
Paleobotany, definition of..........Ann 5, p 363
Paleobotany; flora of the Laramie group, synopsis of the..........Ann 6, pp 399-557
Paleobotany; flora, the older Mesozoic, of Virginia..........Mon VI
Paleobotany; flora, the Potomac or younger Mesozoic..........Mon XV
Paleobotany; flora, types of the Laramie..........Bull 37
Paleobotany, future prospects of..........Ann 5, pp 365-366
Paleobotany; lignite and fossil wood of the Potomac formation..........Bull 56
Paleobotany of the Dakota group..........Mon XVII
Paleobotany of the Eocene..........Bull 83
Paleobotany of the Newark system..........Bull 85, pp 62-65
Paleobotany; plants, fossil, internal structure of, value of the study of the..Bull 56, pp 11-38
Paleobotany; plants, fossil, of the Triassic rocks of New Jersey and the Connecticut valley..........Mon XIV, pp 77-95
Paleobotany; plants, fossil, the geographical distribution of....Ann 8, II, pp 663-960
Paleobotany, sketch of..........Ann 5, pp 357-452
Paleobotany; stratigraphy of the bituminous coal fields of Pennsylvania, Ohio, and West Virginia (fossil plants mentioned)..........Bull 65
Paleobotany; travertine and siliceous sinter, the formation of, by the vegetation of hot springs..........Ann 9, pp 613-676
Paleobotany and botany, interdependence of..........Ann 5, pp 366-367
Paleobotany. See, also, Paleontology.
Paleontology; Aucella of California, remarks on the genus.....Mon XIII, pp 226-232
Paleontology; birds with teeth..........Ann 3, pp 45-88
Paleontology; Brachiopoda and Lamellibranchiata of the Raritan clays and greensand marls of New Jersey..........Mon IX
Paleontology; butterflies, the fossil, of Florissant, Colorado....Ann 8, I, pp 433-474
Paleontology; classification, paleontologic characters as a basis for..........Ann 7, pp 372-377
Paleontology; correlation papers: Archean and Algonkian..........Bull 86
Paleontology; correlation papers: Cambrian..........Bull 81

Paleontology; correlation papers: Cretaceous .... Bull 82
Paleontology; correlation papers: Devonian and Carboniferous .... Bull 80
Paleontology; correlation papers: Eocene .... Bull 83
Paleontology; correlation papers: Neocene .... Bull 84
Paleontology; correlation papers: Newark .... Bull 85
Paleontology; Crustacea, Paleozoic, a bibliography of, from 1698 to 1889 ..... Bull 63
Paleontology; Dinocerata, an extinct order of gigantic mammals .... Ann 5, pp 243-302; Mon x
Paleontology; Eureka district, Nevada, paleontologic divisions of strata in the .... Mon xx, pp 182-184
Paleontology; fauna of the lower Cambrian or Olenellus zone ... Ann 10, I, pp 509-763
Paleontology; faunas, Cambrian, of North America .... Bull 10; Bull 30
Paleontology; faunas, fossil, of the upper Devonian, from Tompkins county, New York, to Bradford county, Pennsylvania .... Bull 3
Paleontology; faunas, fossil, of the upper Devonian, the Genesee section, New York .... Bull 41
Paleontology; faunas, the higher Devonian, of Ontario county, New York ... Bull 16
Paleontology; fishes, fossil, of the Triassic rocks of New Jersey and the Connecticut valley .... Mon XIV, pp 17-76
Paleontology; fishes, the Paleozoic, of North America .... Mon XVI
Paleontology; fossils, new Cretaceous, from California .... Bull 22
Paleontology; Gasteropoda and Cephalopoda of the Raritan clays and greensand marls of New Jersey .... Mon XVIII
Paleontology; insects, fossil, a classed and annotated bibliography of .... Bull 69
Paleontology; insects, fossil, including myriapods and arachnids, systematic review of our present knowledge of .... Bull 31
Paleontology; insects, known fossil, of the world, including myriapods and arachnids, index to the .... Bull 71
Paleontology; invertebrate fossils from the Pacific coast .... Bull 51
Paleontology, invertebrate, of the Eocene .... Bull 83
Paleontology, invertebrate, of the Neocene .... Bull 84
Paleontology, invertebrate, of the Newark system .... Bull 85, pp 58-61
Paleontology; invertebrates, the fresh-water, of the N. A. Jurassic .... Bull 29
Paleontology; Lahontan basin, Nevada, paleontologic contributions from the .... Mon XI, pp 238-249
Paleontology, Mesozoic and Cenozoic, of California .... Bull 15
Paleontology; Mesozoic fossils .... Bull 4
Paleontology; Mollusca, fossil, of western North America, marine Eocene, fresh-water Miocene, and other .... Bull 18
Paleontology; Mollusca, marine, list of, comprising the Quaternary fossils and recent forms from American localities between cape Hatteras and cape Roque, including the Bermudas .... Bull 24
Paleontology; Mollusca, nonmarine fossil, of North America, a review of the .... Ann 3, pp 403-550
Paleontology; Mollusca, the Quaternary and recent, of the Great basin, with descriptions of new forms .... Bull 11, pp 13-49
Paleontology; Molluscan fauna, the relation of the Laramie, to that of the succeeding fresh-water Eocene and other groups .... Bull 34
Paleontology; Nantucket, the geology of, with lists of invertebrates .. Bull 53, pp 34-38
Paleontology, objects of .... Ann 5, pp 363-364
Paleontology of the Eureka district, Nevada .... Ann 3, pp 256-259, 261, 262, 265-267, 269, 270-271; Mon VIII; Mon XX, pp 319-333
Paleontology; Ostreidæ, fossil, of North America, a review of the .. Ann 4, pp 27-430
Paleontology; quicksilver belt of California, historical geology of the, with lists of fossils .... Mon XIII, pp 176-225
Paleontology, tendency to specialize in .... Ann 9, p 22

Paleontology; Tertiary and Cretaceous strata of the Tuscaloosa, Tombigbee, and Alabama rivers, with mention of invertebrates.................... Bull 43
Paleontology; Texan Permian and its Mesozoic types of fossils.............. Bull 77
Paleontology; Texas, the present condition of knowledge of the geology of, with mention of invertebrates.................................... Bull 45
Paleontology, value of, to stratigraphy .... Bull 56, pp 11-12
Paleontology, vertebrate, of the Newark system.................. Bull 85, pp 54-58
Paleontology. See, also, Paleobotany.
Paleozoic Crustacea, bibliography of, from 1698 to 1889, including a list of North American species and a systematic arrangement of genera...... Bull 63
Paleozoic fishes of North America....................................... Mon XVI
Paleozoic formations in the Acadian province, correlations and classifications of.. Bull 80, pp 226-257
Paleozoic formations in the Eureka district, Nevada......................... Ann 3, pp 248-272; Mon XX, pp 11-13, 34-185
Paleozoic formations of the Leadville district, Colorado .... Ann 2, pp 216-220; Mon XII, pp 53-70, 277-278
Paleozoic history of the Mississippi valley and of the Rocky mountain region.. Bull 57, pp 11, 12
Paleozoic rocks and history of northeastern Iowa and contiguous territory..... Ann 11, I, pp 308-334, 347-353
Paleozoic rocks of California.................................... Bull 19, pp 21-23
Paleozoic rocks of Texas... Bull 45, pp 56-57
Paleozoic rocks of the Great basin.......................... Mon XX, pp 185-209
Paleozoic section of Nevada, with vertical range of genera..... Mon VIII, pp 284-285
Paleozoic shoreline of the Great basin......................... Mon XX, pp 175-177
Paleozoic. See, also, Cambrian; Carboniferous; Devonian; Silurian.
Pallasite from Kansas, description and analysis of...................... Bull 78, p 94
Palmitic acid, compressibility and thermal expansion of........... Bull 92, pp 32-33
Pamunkey formation .... Ann 12, I, pp 418-419
Paraffin, compressibility and thermal expansion of................. Bull 92, pp 36-37
Paramorphism, general discussion of............................... Bull 28, pp 45-49
Paramorphism in relation to uralitization .... Bull 62, pp 52-54
Paramorphism of pyroxene to hornblende .... Bull 28, p 46; Bull 59, pp 25-27
Para-toluidine, compressibility and thermal expansion of .... Bull 92, pp 33-34
Paria plateau, Grand cañon district, description of the................. Ann 2, p 70; Mon II, pp 10, 199-202
Park range, Wyo., literature of the geology of the ...... Bull 86, pp 272, 274, 275, 316
Parker (E. W.), antimony, statistics of........................ MR 1891, pp 174-176
Parker (E. W.), asbestos, statistics of........................ MR 1891, pp 591-592
Parker (E. W.), asphaltum, statistics of .... MR 1889-90, pp 477-481; MR 1891, pp 452-455
Parker (E. W.), barytes, statistics of.......................... MR 1891, pp 599-600
Parker (E. W.), buhrstones, statistics of.............................. MR 1891, p 552
Parker (E. W.), coal, statistics of..... MR 1889-90, pp 145-286; MR 1891, pp 177-356
Parker (E. W.), emery and corundum, statistics of..................... MR 1891, p 556
Parker (E. W.), fluorspar, statistics of .... MR 1891, p 586
Parker (E. W.), graphite, statistics of .... MR 1891, pp 589-590
Parker (E. W.), gypsum, statistics of.......................... MR 1891, pp 580-583
Parker (E. W.), mineral paints, statistics of.................... MR 1891, pp 595-598
Parker (E. W.), oilstones and whetstones, statistics of .... MR 1891, pp 554-555
Parker (E. W.), soapstone, statistics of .... MR 1891, pp 593-594
Parker (E. W.), sulphur, statistics of .... MR 1891, pp 564-571
Pasturage lands of the West .... Ann 11, II, p 209
Peace creek bone bed .... Bull 84, pp 130-131
Peale (A. C.), administrative report for 1886-87 .... Ann 8, I, pp 146-148

Peale (A. C.), administrative report for 1887-88 .... Ann 9, pp 111-114

Peale (A. C.), administrative report for 1888-89 .... Ann 10, I, pp 130-132

Peale (A. C.), administrative report for 1889-90 .... Ann 11, I, p 82

Peale (A. C.), administrative report for 1890-91 .... Ann 12, I, pp 91-92

Peale (A. C.), lists and analyses of the mineral springs of the U. S. .... Bull 32

Peale (A. C.), mineral waters, statistics of .... MR 1883-84, pp 978-987; MR 1885, pp 536-543; MR 1886, pp 715-721; MR 1887, pp 680-687; MR 1888, pp 623-630; MR 1889-90, pp 521-535; MR 1891, pp 601-610

Peat of American bogs .... Ann 10, I, pp 303-304

Pecos valley, New Mexico, irrigation in the .... Ann 12, II, pp 282-290

Pele's hair in Hawaii .... Ann 4, p 108

Pennsylvania, altitudes in .... Bull 5, pp 245-274; Bull 76

Pennsylvania, anthracite coal fields of, description and production of the .... MR 1882, pp 7-24

Pennsylvania; bituminous coal field in Pennsylvania, Ohio, and West Virginia, stratigraphy of the .... Bull 65

Pennsylvania, boundary lines of .... Bull 13, pp 78-80

Pennsylvania, bromine industry of .... MR 1885, p 487; MR 1886, p 642; MR 1887, pp 626, 627; MR 1888, p 613; MR 1889-90, p 493; MR 1891, p 579

Pennsylvania, building stone from, statistics of .... MR 1882, pp 451, 452; MR 1887, pp 514, 516; MR 1888, pp 536, 541, 545; MR 1889-90, pp 373, 418-427; MR 1891, pp 457, 460, 461, 463, 464, 467

Pennsylvania, Cambrian rocks of .... Bull 81, pp 124-132, 288-289, 382-383

Pennsylvania, cement manufacture in .... MR 1887, p 527; MR 1888, p 551; MR 1889-90, p 461; MR 1891, pp 532, 536

Pennsylvania, Cenozoic gravels of .... Bull 84, pp 44-45

Pennsylvania, clay, brick, and pottery industry of .... MR 1882, pp 465, 469; MR 1883-84, pp 696, 698; MR 1885, pp 416, 418; MR 1886, p 569; MR 1887, pp 536, 539, 540; MR 1888, pp 563, 566; MR 1891, pp 503-504

Pennsylvania, coal area and statistics of .... Ann 2, p xxviii; MR 1882, pp 7-32, 67-72; MR 1883-84, pp 12, 66-87; MR 1885, pp 11, 45-64; MR 1886, pp 224, 230, 295-340; MR 1887, pp 169, 171, 290-350; MR 1888, pp 169, 171, 301-360; MR 1889-90, pp 241, 252-269; MR 1891, pp 180, 288-320

Pennsylvania, cobalt deposit in .. MR 1882, p 421; MR 1883-84, p 546; MR 1885, p 363

Pennsylvania, coke in, the manufacture of .... MR 1883-84, pp 175-196; MR 1885, pp 80, 96-111; MR 1886, pp 378, 384, 408-417; MR 1887, pp 383, 389, 409-420; MR 1888, pp 395, 400, 414-425; MR 1891, pp 360, 366, 386-394

Pennsylvania, Cretaceous deposits of .... Bull 82, p 87

Pennsylvania; fossil faunas of the upper Devonian along the meridian of 76° 30′, from Tompkins county, N Y., to Bradford county, Penn .... Bull 3

Pennsylvania, fossils from .... Ann 8, II, pp 862-870; Mon XVI, pp 85-123

Pennsylvania, geologic and paleontologic investigations in .... Ann 5, p 52; Ann 6, pp 25, 31, 35, 74, 75; Ann 7, pp 67, 83; Ann 8, I, p 168; Ann 9, pp 77, 122

Pennsylvania, geologic maps of, listed .... Bull 7, pp 64-76, 162, 163

Pennsylvania; glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana, and Illinois .... Bull 58

Pennsylvania, glacial investigations in ... Ann 3, pp 341-343, 346, 348, 351; Ann 7, p 157

Pennsylvania, granite production of .... MR 1891, pp 457, 460

Pennsylvania, graphite mines in .... MR 1886, p 686

Pennsylvania, iron and steel from, statistics of .... Ann 2, p xxviii, MR 1882, pp 120, 125, 129, 130, 131, 132, 133, 134, 135, 136, 137; MR 1883-84, pp 252, 270; MR 1885, pp 182, 184, 186, 188; MR 1886, pp 14, 18, 52-56; MR 1887, pp 11, 16, 44-46; MR 1888, pp 14, 17, 23, 25; MR 1889-90, pp 10, 12, 17; MR 1891, pp 12, 20, 54, 55, 61

Pennsylvania, lime production of .... MR 1887, p 533; MR 1888, p 556

Pennsylvania, limestone from localities in, analyses of ...... MR 1889-90, pp 421-424

Pennsylvania, limestone production of..........MR 1891, pp 464, 467

Pennsylvania, manganese ore in..........MR 1885, pp 342–343; MR 1888, p 124

Pennsylvania, marble production of..........MR 1891, pp 468–469

Pennsylvania, metallic paint production of..........MR 1891, p 597

Pennsylvania, mineral springs of..........Bull 32, pp 44–49; MR 1883–84, p 984; MR 1885, p 540; MR 1886, p 718; MR 1887, p 685; MR 1888, p 628; MR 1889–90, pp 531–532; MR 1891, pp 603, 607

Pennsylvania, minerals of, the useful.....MR 1882, pp 721–726; MR 1887, pp 779–785

Pennsylvania, mining laws of..........MR 1886, pp 759–790

Pennsylvania, natural gas localities and statistics of.......MR 1883–84, pp 236, 243; MR 1885, pp 162–165; MR 1886, pp 490, 502–504; MR 1887, pp 466, 467–474; MR 1888, p 489; MR 1889–90, p 367; MR 1891, p 438

Pennsylvania, Newark system in..........Bull 85, pp 20, 21, 83, 84

Pennsylvania, nickel ore in..........MR 1882, pp 404–405; MR 1883–84, p 537; MR 1889–90, p 124

Pennsylvania, ocher production of..........MR 1891, p 595

Pennsylvania; petroleum, localities and statistics of......MR 1882, pp 190, 199–202; MR 1883–84, pp 214–215, 221–224; MR 1885, pp 131–145; MR 1886, pp 441, 442–457; MR 1887, pp 438, 439–450; MR 1888, pp 444, 445–459; MR 1889–90, pp 292, 295–318

Pennsylvania, rocks of, their classification, etc..........Bull 80, pp 42, 83–112, 124–125, 131, 260–261

Pennsylvania, salt from, statistics of..........MR 1882, pp 532–534, 835–836

Pennsylvania, sandstone from Luzerne, Blair, and Fayette counties, analyses of..........MR 1889–90, pp 419, 420

Pennsylvania, sandstone production of..........MR 1891, pp 461, 463

Pennsylvania, slate production of..........MR 1891, pp 472, 473

Pennsylvania, topographic work in..........Ann 10, I, pp 87, 89; Ann 11, I, p 36; Ann 12, I, p 26

Pennsylvania, zinc and zinc works in..........Ann 2, p xxix, MR 1882, pp 361–365, 373; MR 1883–84, p 476

Penokee iron-bearing series of Mich. and Wis........Ann 10, I, pp 341–507; Mon XIX

Penokee series of rocks of lake Superior..........Bull 86, pp 187–189

Penrose (R. A. F.), jr., nature and origin of deposits of phosphate of lime, with an introduction by N. S. Shaler..........Bull 46

Penrose (R. A. F.), jr., quoted, on the lignite beds of Texas.....MR 1891, pp 327–328

Perezonal formations..........Bull 84, pp 98–99

Peridotite of Elliott co., Ky., composition, origin, etc., of..Bull 38; Bull 42, pp 136–137

Peridotites and associated serpentines near Baltimore, Maryland........Bull 28, p 50

Perkins (J.), lists of ores, minerals, and mineral substances of industrial importance in Alaska, California, Nevada, Oregon, and Washington.....MR 1882, pp 760, 767–769, 772, 773, 775

Permian in Kansas and Nebraska and other parts of the United States, discussions relative to the correlation of the..........Bull 80, pp 193–212

Permian of the Grand canyon district..........Ann 2, pp 64, 91–94; Mon II, pp 16, 43–46, 117–121

Permian strata of the Plateau country..........Ann 6, pp 134–135, 184–185

Permian, the Texan, and its Mesozoic types of fossils..........Bull 77

Permian. See, also, Carboniferous.

Perrenoud (G. F.), talc, statistics of..........MR 1885, pp 534–535

Persia, fossil plants of, literature of the..........Ann 8, II, p 797

Persia, gold from, analysis of..........Bull 60, p 137

Peru, copper production of..........MR 1883–84, p 356; MR 1885, p 229; MR 1886, p 128; MR 1887, p 88; MR 1888, p 73; MR 1889–90, p 73; MR 1891, pp 101, 102

Peru, iodine production of..........MR 1883–84, pp 856–857; MR 1885, p 488

Peru, quicksilver mines of ....Ann 8, II, pp 965–966; Mon XIII, pp 4, 6, 7, 14, 20–23
Petalite from Peru, Maine, description and analysis of.................Bull 60, p 129
Peters (E. D.), jr., the mines and reduction works of Butte city, Montana ....MR 1883–84, pp 374–396
Peters (E. D.), jr., the roasting of copper ores and furnace products.......MR 1882, pp 280–297
Petrographic and paleontologic characters of Devonian beds in New York...Bull 16, pp 13–17, 35–39, 67–68
Petrographic character as a basis for classification of formations..Ann 7, pp 377–390
Petrographic character of Obsidian cliff, Yellowstone park........Ann 7, pp 261–272
Petrographic description of rocks from the Tewan mts., N. M........Bull 66, pp 10–17
Petrographic descriptions; ferruginous slates, cherts, etc., of the Penokee series ....Ann 10, I, pp 383–392
Petrographic descriptions; general or miscellaneous schists of the Penokee series..................................Ann 10, I, pp 354–362, 372–375, 426–434
Petrographic descriptions; greywackes, etc., of the Penokee series...........Ann 10, I, pp 427, 429–432
Petrographic laboratory of the Geological Survey...............Ann 10, I, pp 29, 43–44
Petrographic studies in the Archean formations of the northwestern states......Ann 5, pp 209–242
Petrographic work of the Geological Survey, review of the ....Ann 10, I, pp 42–52
Petrography, bibliography of American, 1886.............................Bull 44, p 27
Petrography, bibliography of American, 1887–89 .... Bull 75, p 128
Petrography; description and analyses of the yellow clay and white marl of the Bonneville beds...................................Mon I, pp 190, 200–203
Petrography, microscopic, development of...........................Bull 62, p 35
Petrography, microscopic, of the eruptive rocks of the Eureka district, Nevada ....Mon XX, pp 335–394
Petrography, microscopic, of the Great basin and mounts Rainier, Hood, Shasta, and Lassen's peak..Ann 3, pp 11–14
Petrography of cape Ann, Massachusetts........................Ann 9, pp 605–610
Petrography of rocks of the basement series in northern Wisconsin ....Ann 10, I, pp 354–362
Petrography of the Delaware traps...Bull 59
Petrography of the Mosquito range, Colorado ....Mon XII, pp 319–362
Petrography of the Newark system.................................Bull 85, pp 32–36
Petrography of the Penokee iron-bearing series ....Mon XIX, *passim*
Petrography of the rocks of the Keweenaw series ....Ann 3, pp 101–115; Mon V, pp 34–133
Petrography; thinolite from lake Lahontan and the Mono basin ....Bull 12
Petrography; transitions in mineralogical composition of igneous rocks........Bull 66, pp 17–20
Petrography. See, also, Lithology.
Petroleum, accumulation of, modes of ....Ann 8, II, pp 507–519
Petroleum, American, character and composition of...........MR 1889–90, pp 288–290
Petroleum, foreign sources of.......................MR 1883–84, pp 231–232; MR 1886, pp 463–487; MR 1887, pp 456–463; MR 1888, pp 467–480
Petroleum from Cuba...Bull 78, pp 98–104
Petroleum; geological factors in gas and oil production........Ann 8, II, pp 581–589
Petroleum; oil fields of the United States ....MR 1883–84, pp 214–220
Petroleum, statistics of ....MR 1882, pp 186–212; MR 1883–84, pp 214–232; MR 1885, pp 130–154; MR 1886, pp 439–487; MR 1887, pp 436–463; MR 1888, pp 442–480; MR 1889–90, pp 287–365; MR 1891, pp 403–435
Petroleum, total product of, in the United States and Canada since 1859........MR 1888, pp 443–444; MR 1891, pp 408–409

Petroleum and inflammable gas in Ohio and Indiana, the Trenton limestone as a source of .... Ann 8, II, pp 475–662

Petroleum and natural gas, theories respecting the origin of.... Ann 8, II, pp 485–506

Petroleum; gas and related bitumens, the origin, constitution, future, etc., of........ Ann 11, I, pp 589–616

Phanerogams from the Carboniferous basins of southwestern Missouri........ Bull 98, pp 105–109

Phenacite from Crystal park and Florissant, Colorado........ Bull 20, pp 68–70

Phillips (W. B.), mica mining in North Carolina........ MR 1887, pp 661–671

Phillips (W. B.), the fertilizer trade in North Carolina in 1886.. MR 1886, pp 611–617

Phinney (A. J.), the natural-gas field of Indiana........ Ann 11, I, pp 579–742

Phosphate of lime, nature and origin of deposits of........ Bull 46

Phosphate rock, statistics and analyses of........ MR 1882, pp 504–521; MR 1883–84, pp 783–805; MR 1885, pp 445–455; MR 1886, pp 607–610; MR 1887, pp 580–590; MR 1888, pp 586–593; MR 1889–90, pp 450–455

Phosphates, bibliography of........ Bull 46, pp 129–140

Phosphates, foreign sources of........ MR 1883–84, pp 803–804; MR 1885, pp 454–455

Phosphates of Alabama........ Bull 46, pp 75–78

Phosphates of Florida........ Bull 46, pp 78–79; MR 1891, pp 562–563

Phosphates of Martha's vineyard........ Bull 46; p 78

Phosphates of North Carolina........ Bull 46, pp 70–75

Phosphates of South Carolina........ MR 1882, pp 504–521; MR 1887, pp 580–584; MR 1891, pp 557–562

Phosphatic deposits of Florida, character and correlation of the........ Bull 84, pp 111–112, 130–131, 134–140

Phosphatic limestone beds of Kentucky........ Bull 46, pp 116–117

Phosphatic matter, accumulation of, in morrasses........ Ann 10, I, pp 307–308

Phosphoric acid, separation of, in rock analyses........ Bull 78, pp 87–90

Phosphorites, foreign........ Bull 46, pp 46–59

Phosphorus from iron slag........ MR 1883–84, p 805

Phosphorus in other countries, production of........ MR 1886, pp 676–677

Phosphorus in steel........ Bull 25, p 14

Phosphorus oxychloride, the action of, on the ethers and chlorhydrines of silicic acid........ Bull 90, pp 47–55

Phosphorus, statistics of........ MR 1886, pp 676–677

Phthanite of the Coast ranges of California described........ Mon XIII, pp 105–108

Physical and chemical effect of sudden cooling of glass........ Bull 42, pp 98–131

Physical effect of precipitants........ Bull 36, pp 24–26

Physical effect of temperature in subsidence of fine solid particles in liquids... Bull 36, pp 21–24

Physical geology of the Grand canyon district........ Ann 2, pp 47–166

Physical properties of the iron-carburets........ Bull 14; Bull 27; Bull 35

Physics and chemistry, work in, during 1884–85........ Ann 6, pp 86–88; Bull 27

Physics and chemistry, work in, during 1885–86........ Ann 7, pp 127–130; Bull 42

Physics and chemistry, work in, during 1886–87........ Ann 8, I, pp 189–193; Bull 55

Physics and chemistry, work in, during 1887–88........ Ann 9, pp 141–143; Bull 60

Physics and chemistry, work in, during 1888–89........ Ann 10, I, pp 177–181; Bull 64

Physics and chemistry, work in, during 1889–90........ Ann 11, I, pp 125–127; Bull 78

Physics and chemistry, work in, during 1890–91........ Ann 12, I, pp 127–129; Bull 90

Physiography; beach ridges and deltas of lake Agassiz........ Bull 39

Physiography; cliffs of Toroweap valley, Arizona........ Mon II, pp 84–88

Physiography; drainage of the Paria plateau........ Mon II, pp 200–203

Physiography; interior basins, origin of........ Mon I, pp 2–5

Physiography of copper-bearing rocks of lake Superior, in relation to structure........ Mon V, pp 165–166

Physiography of Martha's vineyard........Ann 7, pp 306-307
Physiography of Texas........Bull 45, pp 45-54
Physiography of the Grand canyon district........Ann 2, pp 69-73
Physiography of the Hawaiian islands........Ann 4, pp 81-89, 212-219
Physiography of the region about Chesapeake bay........Ann 7, pp 548-564
Physiography; plateaus of the Grand canyon district........Mon II, pp 9-19
Physiography; playa lakes and playas........Mon XI, pp 81-86
Physiography; river courses in Washington territory, changes in, due to glaciation........Bull 40
Physiography; surface of the Kaibab plateau........Mon II, pp 135-139, 192-198
Physiography; terraces of the Grand canyon dist..Mon II, pp 32, 35-37, 40, 42, 46-47
Physiography; terraces of the upper Ohio river district........Bull 58, pp 22-38, 80-96
Physiography; topographic features of shorelines........Ann 5, pp 75-123; Mon I, pp 23-170; Mon XI, pp 87-124
Physiography; topography near Comstock lode due to faulting........Mon III, pp 156, 181-182
Physiography; Vermilion cliffs of southern Utah........Mon II, pp 51-60
Physiography; walls of the Grand canyon of the Colo...Mon II, pp 140-170, 173-178
Physiography and geology of portions of Colo., Utah, and Wyo..Ann 9, pp 677-712
Picrallumogene from vicinity of Las Vegas, New Mexico, analysis of..Bull 78, p 121
Piedmont region of the middle Atlantic slope........Ann 7, pp 548-550
Pig iron. See iron.
Pike's peak, minerals from the neighborhood of........Bull 20, pp 40-73
Pilling (J. C.), resignation of, from office of chief clerk........Ann 12, I, p 19
Pipestone, red, from Minnesota, analysis and tests of........MR 1889-90, p 404
Plantamour (E.), hypsometric method of........Ann 2, pp 480-488, 548-549
Plant life, past and present, of the earth, table and diagrams of, by types and geologic formations, with discussions thereof........Ann 5, pp 439-452
Plants and animals in relation to soil formation........Ann 12 I, pp 268-287
Plants as rock-builders........Ann 9, pp 619-620
Plants, descent of........Ann 5, p 452
Plants, fossil, description of silicified species of, from the Potomac formation........Bull 56, pp 43-52
Plants, fossil, description of species of the Laramie........Bull 37, pp 13-115
Plants, fossil, description of the species of the Potomac or younger Mesozoic........Mon XV, pp 63-325
Plants, fossil, descriptions of genera and species of, from the Trias of New Jersey and the Connecticut valley........Mon XIV, pp 82-95
Plants, fossil, discussion of table of distribution of the Laramie..Ann 6, pp 515-536
Plants, fossil, geological affinities of the Potomac or younger Mesozoic....Mon XV, pp 333-348
Plants, fossil; list of species of the Potomac formation identical with or allied to species described from other localities and formations..Mon XV, pp 358-367
Plants, fossil; list of species of the Potomac formation, with the localities at which they were collected........Mon XV, pp 350-357
Plants, fossil, list of the Potomac or younger Mesozoic........Mon XV, pp 326-331
Plants, fossil, localities for the Potomac or younger Mesozoic.....Mon XV, pp 10-33
Plants, fossil; localities other than those of the Potomac formation at which Potomac species or their allies have been found........Mon XV, pp 368-372
Plants, fossil, nomenclature and classification of........Ann 5, pp 425-431
Plants, fossil, of the Dakota group........Mon XVII
Plants, fossil, of the Devonian of the Eureka district, Nevada....Mon XX, pp 69-70
Plants, fossil, of the higher Devonian of Ontario co., N. Y..Bull 16, pp 25-28, 63-65
Plants, fossil, of the Laramie age........Ann 6, pp 436-440
Plants, fossil, of the Newark system........Bull 85, pp 62-65, 126-129

Plants, fossil; sketch of paleobotany........................Ann 5, pp 357-452
Plants, fossil; stratigraphy of the bituminous coal field of Pennsylvania, Ohio, and West Virginia, with mention of species....................Bull 65
Plants, fossil, synopsis of the flora of the Laramie group of.......Ann 6, pp 399-557
Plants, fossil, table of distribution of the Laramie ....Ann 6, pp 440-511
Plants, fossil, table of number of species of, from each geological formation..Ann 5, pp 440-441
Plants, fossil, table of the, from the older Mesozoic of N. C.....Mon VI, pp 122-123
Plants, fossil, table of the, from the older Mesozoic of Virginia....Mon VI, pp 92-93
Plants, fossil, the geographical distribution of.................Ann 8, II, pp 663-960
Plants, fossil; the older Mesozoic flora of North Carolina, with description of species..Mon VI, pp 97-128
Plants, fossil; the older Mesozoic flora of Virginia, with description of species..Mon VI, pp 1-96
Plants, fossil, value of the study of the internal structure of, with review of its progress...Bull 56, pp 11-88
Plants, fossil; wood and lignite of the Potomac formation..................Bull 56
Plants; travertine and siliceous sinter, the formation of, by the vegetation of hot springs ....Ann 9, pp 613-676
Plants, types of..Ann 5, pp 432-433
Plateau country of the western part of the United States, map showing the..Ann 6, pp 114-115
Plateau province of western United States ....Ann 2, pp 49-68; Ann 6, 113-124; Mon II, pp 9-15, 217-218
Plateau province. See, also, Arizona; Colorado; New Mexico; Utah; Wyoming.
Platiniferous nickel ore from Canada................................Bull 64, pp 20-21
Platiniridium, analyses of ....MR 1883-84, p 581
Platinum, foreign sources of..........MR 1883-84, pp 576-577; MR 1885, pp 367-368
Platinum ores, analyses of.........................MR 1883-84, p 577; MR 1885, p 367
Platinum, pyro-electric qualities of alloys of....................Bull 54, pp 126-164
Platinum, statistics of...MR 1882, pp 442-443; MR 1883-84, pp 576-580; MR 1885, pp 367-369; MR 1886, pp 222-223; MR 1887, pp 142-143; MR 1888, pp 165-167; MR 1889-90, pp 143-144
Platte river basin, hydrography of the.........................Ann 12, II, pp 238-240
Playa mud from Carson desert, Nevada, analysis of......................Mon XI, p 83
Playa lakes and playas, especially those in the Lahontan basin....Mon XI, pp 81-85
Pleistocene; beaches and deltas of lake Agassiz................................Bull 39
Pleistocene bitumen deposits.................................Ann 11, I, pp 595-596
Pleistocene climate as revealed by the lake Lahontan records....Mon XI, pp 255-268
Pleistocene climate, especially of the Great basin..............................Ann 4, pp 463-464; Mon I, pp 265-318
Pleistocene; Columbia formation, description of the.......................Ann VII, pp 594-612, 635; Ann 12, I, pp 384-407
Pleistocene; Columbia formation in relation to the Lafayette..Ann 12, I, pp 430-496
Pleistocene, denudation in the Grand canyon of the Colorado during the.....Ann 2, pp 95-101
Pleistocene; deposits of hot springs................................Ann 9, pp 619-676
Pleistocene drainage in the Great basin............................Mon XI, pp 28-32
Pleistocene; driftless area of the upper Mississippi.................Ann 6, pp 205-322
Pleistocene; earthquake, the Charleston ....Ann 9, pp 209-528
Pleistocene; earthquakes in California in 1889..................................Bull 68
Pleistocene epochs, provisional classification of the, with attendant or characteristic phenomena.............................Ann 6, p 212; Mon I, p 273
Pleistocene; Equus fauna, age of the..............................Mon I, pp 393-402

Pleistocene formations of the Leadville district, Colorado....................Ann 2, pp 220–221, 256; Mon XII, pp 40–42, 71–72
Pleistocene fossils and recent forms from American localities between cape Hatteras and cape Roque, including the Bermudas....................Bull 24
Pleistocene; glacial boundary in Penn., Ohio, Ky., Ind., and Ill ....Bull 58
Pleistocene; glacial phenomena about Leadville, Colorado........Ann 2, pp 228–230
Pleistocene; glaciation; terminal moraine of the second glacial epoch.......Ann 3, pp 295–402
Pleistocene; glaciers of the Sierra nevada........................Ann 5, pp 309–355
Pleistocene history of Mono valley, California....................Ann 8, I, pp 261–394
Pleistocene history of northeastern Iowa.... ....Ann 11, I, pp 189–577
Pleistocene history recorded in the Columbia formation...........Ann 7, pp 637–639
Pleistocene lacustrine formations in Mexico................................Mon I, p 402
Pleistocene; lake Bonneville, geological history of........Ann 2, pp 167–200; Mon I
Pleistocene; lake Lahontan, northwestern Nevada, geological history of.....Ann 3, pp 195–235; Mon XI
Pleistocene; lake shores, topographic features of....................Ann 5, pp 75–123
Pleistocene lakes of the Great basin, map showing the..........................Ann 8, I, pp 268–269; Mon I, pp 6–7
Pleistocene lakes of the Great basin, sketch of the...................Bull 11, pp 9–12
Pleistocene mammalian fauna of Great Britain ....Mon I, pp 399, 400, 401
Pleistocene Mollusca of the Great basin........Bull 11, pp 13–66; Mon I, pp 298–299
Pleistocene; morasses, fresh-water, of the United States.......Ann 10, I, pp 261–339
Pleistocene of cape Ann, Massachusetts ....Ann 9, pp 546–576
Pleistocene of central Oregon ....Ann 4, pp 435–464
Pleistocene of Florida ....Bull 84, pp 149–156
Pleistocene of Martha's vineyard..........................Ann 7, pp 306–325, 347–353
Pleistocene of mount Desert, Maine..........................Ann 8, II, pp 994–1034
Pleistocene of southwestern Kansas...............................Bull 57, pp 38–45
Pleistocene of Texas ....Bull 45, pp 86–87
Pleistocene of the vicinity of Chesapeake bay ....Ann 7, pp 545–646
Pleistocene of the Eureka district, Nevada ....Mon XX, pp 31–33
Pleistocene on Nantucket island...Bull 53
Pleistocene, Ostreidæ of the.......................................Ann 4, pp 314–316
Pleistocene, Quaternary, and Glacial, remarks on the use of the names.......Mon I, pp 22, 395–396
Pleistocene; river courses in the state of Washington, changes in, due to glaciation..Bull 40
Pleistocene; rock-scorings of the great ice invasions.............Ann 7, pp 155–248
Pleistocene; subaërial decay of rocks and origin of the red color of certain formations...Bull 52
Pleistocene; swamps, sea-coast, of eastern United States..........Ann 6, pp 359–398
Pleistocene; thinolite, crystallographic study of.............................Bull 12
Pleistocene; volcanic eruption, a late, in northern California and its peculiar lava ....Bull 79
Pleistocene volcanic eruptions in western U. S.......Mon I, pp 323, 326, 330, 336–338
Pleistocene volcanic eruptions of the Uinkaret plateau...........Mon II, pp 111–112
Pleistocene winds in the lake Bonneville basin.............................Mon I, p 332
Pliocene, boundaries of the ....Bull 84, p 22
Pliocene and post-Pliocene in California ....Mon XIII, pp 219–221, 461
Pliocene. See, also, Neocene.
Pogonip limestone at Eureka, Nevada................................Mon XX, pp 48–54
Poicilitic structure of igneous rocks.......................Bull 62, pp 78, 79, 183, 196
Pollock (W. C.), digest of decisions relating to the use and control of water in the arid region. See p. 324 of this bulletin.
Porcelain clays from China, analyses of..............................Bull 27, pp 71–72

Porphyrite and porphyry, use of the terms........................Ann 12, I, p 582
Porphyrites of the Henry mountains........................Mon XII, pp 359–363
Porphyrites of the Mosquito range, Colorado ....Mon XII, pp 85, 334–344
Porphyroids, schistose porphyries or, of Michigan................Bull 62, pp 119–122
Porphyry, alteration products of, analyses of........................Mon XII, p 603
Porphyry, quartzless, of the Keweenaw series........................Mon V, pp 91–95
Portland cement in America, history of........................MR 1891, pp 535–537
Portland group of rocks of New Brunswick........................Bull 86, pp 230–238
Portugal, antimony production of........................MR 1883–84, p 645
Portugal, copper production of........MR 1882, p 254; MR 1883–84, pp 356, 367–368; MR 1885, pp 228, 237–238; MR 1886, pp 128, 133–135; MR 1887, pp 87, 95–96; MR 1888, p 73; MR 1889–90, p 73; MR 1891, p 100
Portugal, fossil plants of, literature of the ....Ann 8, II, pp 705–707
Portugal, manganese production of ....MR 1886, p 201; MR 1889–90, p 130
Portugal, pyrites production of ....MR 1883–84, pp 882–884; MR 1885, pp 507–508; MR 1886, pp 654–656
Portugal, tin production of ....MR 1883–84, p 618
Potassium and sodium, a method for the separation of, from lithium by the action of amyl alcohol on the clorides, with some reference to a similar separation of the same from magnesium and calcium ....Bull 42, pp 73–88
Potassium salts, analyses of ....MR 1887, pp 632–639
Potassium salts, statistics of........................MR 1887, pp 628–650
Potomac and Tuscaloosa formations ....Ann 12, I, pp 421–424
Potomac beds, location and geology of the ....Ann 7, pp 546–547, 613–616, 636; Mon XV, pp 33–62; Bull 56, pp 38–39
Potomac clays, description of the........................MR 1891, p 492
Potomac formation, fossil wood and lignite of the ....Bull 56
Potomac or younger Mesozoic flora ....Mon XV
Potomac plants, geological affinities of the........................Mon XV, pp 333–348
Potsdam sandstone of Wisconsin ....Mon XIX, p 29
Pottery, statistics of........................MR 1882, pp 471–472; MR 1883–84, pp 685–692, 698–700; MR 1885, pp 419–421; MR 1886, pp 571–572; MR 1887, pp 542–545; MR 1888, pp 571–575; MR 1889–90, pp 441–444
Pottery clays, analyses of........................MR 1882, p 472; MR 1883–84, p 690
Powell (J. W.), appointment of, to directorship........................Ann 2, pp xi–xii
Powell (J. W.), report of director for 1880–81........................Ann 2, pp xi–lv
Powell (J. W.), report of director for 1881–82........................Ann 3, pp xv–xviii
Powell (J. W.), report of director for 1882–83 ....Ann 4, pp xiii–xxxii
Powell (J. W.), report of director for 1883–84........................Ann 5, pp xvii–xxxvi
Powell (J. W.), report of director for 1884–85 ....Ann 6, pp xv–xxix
Powell (J. W.), report of director for 1885–86........................Ann 7, pp 3–42
Powell (J. W.), report of director for 1886–87........................Ann 8, I, pp 3–93
Powell (J. W.), report of director for 1887–88 ....Ann 9, pp 3–46
Powell (J. W.), report of director for 1888–89 ....Ann 10, I, pp 3–80
Powell (J. W.), preliminary report of director on the irrigation survey (reprint of)........................Ann 10, II, pp 15–29
Powell (J. W.), report of director on the irrigation survey for 1888–89.......Ann 10, II, pp 1–65
Powell (J. W.), report of director for 1889–90........................Ann 11, I, pp 3–30
Powell (J. W.), report of director on the irrigation survey for 1889–90....Ann 11, II, pp 1–200
Powell (J. W.), report of director for 1890–91........................Ann 12, I, pp 3–19
Powell (J. W.), report of director on the irrigation survey for 1890–91......Ann 12, II
Powell (J. W.), statements before the committee on irrigation of the house of representatives........................Ann 11, II, pp 203–289

Powellite, a new mineral species, description and analysis of........Bull 90, pp 34–37
Prairie soils..Ann 12, I, 323–326
Pre-Cambrian rocks of North America, review of present state of knowledge of the........Bull 86
Precious-metal ore deposits of the Comstock lode, Nevada, source of genesis of the........Mon III, pp 18–21, 285–288
Precious-metal ore deposits of the Leadville district, Colorado, source or genesis of the........Mon XII, pp 367–584, 594
Precious-metal ore deposits, popular fallacies regarding..........Ann 4, pp 253–271
Precious-metal statistics........Ann 1, p 73; Ann 2, pp xxxiv–xxxvii, 331–401; MR 1882, pp 172–185; MR 1883–84, pp 312–321; MR 1885, pp 200–207; MR 1886, pp 104–108; MR 1887, pp 58–65; MR 1888, pp 36–42; MR 1889–90, pp 48–55; MR 1891, pp 74–80
Precious metals, discovery of the, in Colorado........Mon XII, pp 7–10
Precious metals of Eureka, Nevada........Mon VII
Precious metals. See, also, Gold; Silver.
Precious stones, American........MR 1882, pp 483–499
Precious stones, foreign sources of........MR 1887, pp 563–579
Precious stones, localities of, in the United States........MR 1883–84, pp 728–781
Precious stones, statistics of......MR 1882, pp 482–503; MR 1883–84, pp 723–782; MR 1885, pp 437–444; MR 1886, pp 595–605; MR 1887, pp 555–579; MR 1888, pp 580–585; MR 1889–90, pp 445–448; MR 1891, pp 539–551
Pressure and temperature, dependence of fluid volume on..........Bull 92, pp 17–67
Pressure, contractions due to cooling under........Bull 92, pp 56–61
Pressure, effect of, on the electrical conductivity of mercury.......Bull 92, pp 68–77
Pressure, high, the behavior of solids under........Bull 55, pp 67–75
Pressure in relation to schistose structure........Bull 59, p 43
Pressure, influence of, on crystallization of igneous magmas............Bull 66, p 25
Pressure, very high, method of obtaining and of measuring........Bull 96, pp 17–32
Pre-Tertiary igneous rocks of Eureka district, Nevada............Ann 3, pp 273–276; Mon XX, pp 218–229
Priceite from Chetco, Oregon, analysis of........MR 1889–90, p 505
Primeval rocks, possible character of........Mon XIII, pp 171–174
Primitive rocks, history of the term........Bull 86, p 470
Prince Edward island, presence or absence of Newark rocks on......Bull 85, pp 25–31
Principles and definitions in geologic science........Ann 11, I, pp 238–303
Prochlorite from Foundry run, Georgetown, D. C., analysis of..........Bull 9, p 13
Proctor (J. R.), list of ores, minerals, and mineral substances of industrial importance in Kentucky........MR 1882, pp 684–686
Propylite, a decomposition product of various rocks.....Ann 2, p 297; Mon III, pp 81–90, 135–144, 375; Bull 17, p 30
Prosopite from near Pike's peak, Colorado, occurrence, chemical investigation, etc., of........Bull 20, pp 62–66
Prospect mountain limestone at Eureka, Nevada........Mon XX, pp 36–38
Prospect mountain quartzite at Eureka, Nevada........Mon XX, p 35
Prospecting, methods of, in the Eureka district, Nevada.......Mon VII, pp 139–149
Prospecting rules for Penokee district........Mon XIX, pp 276–279
Pseudodiabase of the Coast ranges of California........Mon XIII, pp 94–99, 101–102
Pseudodiorite of the Coast ranges of California........Mon XIII, pp 99–101
Pseudomorphism after limestone, evidences of, in ores........Mon VII, p 98
Pteropoda; Matthevia from the upper Cambrian of New York, description of........Bull 30, pp 223–225
Pteropoda of the Cambrian of the Eureka district, Nevada.....Mon VIII, pp 23–24
Pteropoda of the Carboniferous of the Eureka district, Nevada....Mon VIII, p 264
Pteropoda of the Devonian of the Eureka district, Nevada....Mon VIII, pp 196–200

Pteropoda of the higher Devonian of Ontario county, New York..Bull 16, pp 22, 56-57
Pteropoda of the lower Silurian of the Eureka district, Nevada..Mon VIII, pp 85-86
Pteropoda of the middle Cambrian of North America............Bull 30, pp 131-146
Pteropoda of the Olenellus zone..............................Ann 10, I, pp 620-625
Puerco beds, literature and correlation of the....Bull 83, pp 119-129, 137-138, 145-146
Puerco river, New Mexico, irrigation possibilities along the....Ann 12, II, pp 275-277
Puget group, digest of the literature pertaining to the ....Bull 83, pp 107-110
Puget group of Washington ....Bull 84, pp 229-230
Puget sound region, Molluscan fauna from the.....................Bull 51, pp 49-63
Pumice refused by basalt..................................Mon XX, pp 381-385
Pumice, rhyolitic, of the Eureka district, Nevada...............Mon XX, pp 380-385
Pumice-stone, statistics of.....MR 1882, pp 480; MR 1883-84, p 721; MR 1885, p 483
Pumpelly (R.), administrative report for 1879-80...................Ann 1, pp 57-60
Pumpelly (R.), administrative report for 1880-81...................Ann 2, pp 35-40
Pumpelly (R.), administrative report for 1884-85.........................Ann 6, p 18
Pumpelly (R.), administrative report for 1885-86...................Ann 7, pp 60-61
Pumpelly (R.), administrative report for 1886-87................Ann 8, I, pp 124-125
Pumpelly (R.), administrative report for 1887-88...................Ann 9, pp 75-76
Pumpelly (R.), administrative report for 1888-89...............Ann 10, I, pp 114-116
Pumpelly (R.), administrative report for 1889-90................Ann 11, I, pp 64-65
Pumpelly (R.), administrative report for 1890-91................Ann 12, I, pp 67-70
Pumpelly (R.), report on chemical work in 1879-80................Ann 1, pp 47-48
Pyramid lake, analysis of the water of...........................Mon XI, pp 57-58
Pyrite, formation of, in Comstock lode...........................Mon III, p 210
Pyrite, solubility of ....Mon XIII, pp 432-433, 474
Pyrites, analyses of ....MR 1883-84, pp 877, 878, 879, 880, 881, 884, 885;
MR 1885, pp 501-508, 514; MR 1886, pp 652, 712
Pyrites, foreign deposits of.................................MR 1883-84, pp 881-886;
MR 1885, pp 506-508; MR 1886, pp 654-656
Pyrites, statistics of......................................MR 1883-84, pp 877-905;
MR 1885, pp 501-517; MR 1886, pp 650-675; MR 1887, pp 95, 556, 609-610; MR 1888, pp 5, 584; MR 1889-90, p 518; MR 1891, pp 570-571
Pyrites residue, ordinary, analysis of ....MR 1885, p 514
Pyro-electric qualities of alloys of platinum....................Bull 54, pp 126-164
Pyrolusite from the Crimora mine, Virginia, analysis of...........MR 1883-84, p 551
Pyrolusite from the Etowah region, Georgia, analyses of.........MR 1883-84, p 552
Pyrometric use of viscosity ....Bull 54, pp 239-306
Pyrometry, general account of methods of.........................Bull 54, pp 23-55
Pyroxene and serpentine from Montville, New Jersey, description and analyses of ....Bull 60, p 137
Pyroxene magma in the Eureka district, Nevada ....Mon XX, pp 255-257
Pyroxene, rhombic, in andesites...................................Bull 1, pp 31-36
Pyroxene, rhombic, in diabasic rocks.................................Bull 1, p 35
Pyroxene rocks free from feldspar and olivine........................Bull 28, p 55
Pyroxene-andesite of the Eureka district, Nevada......Mon XX, pp 239-242, 348-364
Pyrrhotite, typical composition of..................................MR 1885, p 516
Quantitative determination of silver by means of the microscope..Ann 6, pp 323-352
Quartz as a product of mineralogical metamorphism.................Bull 62, p 210
Quartz, conversion of, to serpentine..............................Mon XIII, p 123
Quartz fragments, enlargements of, and genesis of quartzites....Bull 8, I, pp 11-43
Quartz in basalt..Mon XX, p 339
Quartz, primary, the occurrence of, in certain basalts.........................Bull 66
Quartz, secondary enlargement of, in sandstones ....Ann 5, pp 218-237; Bull 8, pp 11-43

Quartz, statistics of..MR 1882, p 586;
MR 1883–84, pp 748–756, 763–765; MR 1885, pp 438, 440, 441, 443; MR 1886, pp 595, 596, 604; MR 1887, pp 556, 557; MR 1888, pp 584–585; MR 1889–90, p 446; MR 1891, pp 539, 547
Quartz-bearing basalt, distribution of..............................Bull 79, pp 30–33
Quartz-bearing basalt from Arizona.......................................Bull 66, p 21
Quartz-bearing basalt from Colorado......................................Bull 66, p 22
Quartz-bearing basalt from northern California..................................Bull 79
Quartz-bearing basalt from the Tewan mountains, New Mexico....Bull 66, pp 16, 20
Quartzite, Cambrian, of the Mosquito range, Colorado.............Mon XII, pp 58–60
Quartzite of the Penokee series..Ann 10, I, p 375
Quartzite, the Eureka...Mon XX, pp 54–57
Quartzites, genesis of..Bull 8, pp 11–43, 48–52
Quartzite mountains, Colo., literature of the geology of the..Bull 86, pp 319–323, 507
Quartz-porphyry of the Eureka district, Nevada...........Mon XX, pp 220–221, 345
Quartz-porphyry of the Keweenaw series...............................Mon V, pp 95–112
Quartz-porphyry of the Marquette region, Michigan..............Bull 62, pp 148–151
Quartz-porphyry of the Mosquito range, Colorado........Mon XII, pp 76–81, 323–332
Quartz-porphyry of the Washoe district, Nevada..Mon III, pp 45–48, 108–112, 150, 196
Quartz-slate member of the Penokee series.......................................Ann 10, I,
pp 370–379; Mon XIX, pp 146–171
Quaternary. See Pleistocene.
Quicksilver, African localities of......................................Mon XIII, pp 43–44
Quicksilver, Asian localities of...Mon XIII, pp 44–48
Quicksilver, Australian localities of....................................Mon XIII, pp 48–50
Quicksilver deposits of the Pacific slope.............Ann 8, II, pp 961–985; Mon XIII
Quicksilver deposits, similarity of...................................Mon XIII, pp 401–407
Quicksilver, European localities of.....................................Mon XIII, pp 27–43
Quicksilver, foreign occurrences of, notes on..............Mon XIII, pp 14–55, 452–453
Quicksilver, foreign production of, statistics of the.............MR 1882, pp 392–393;
MR 1883–84, pp 496–497; MR 1885, pp 290–293; MR 1887, p 125; MR 1888, pp 105–107; MR 1889–90, p 102; MR 1891, p 123
Quicksilver mines in California and throughout the world, maps showing the distribution of the..........Ann 8, II, pp 966–967, 968–969; Mon XIII, plates I, II
Quicksilver, North American localities of.............................Mon XIII, pp 15–19
Quicksilver-ore deposits of the Coast ranges, age of the...............Mon XIII, p 225
Quicksilver-ore deposits of Huancavelica, Peru...............................Mon XIII, p 6
Quicksilver ore, genesis and source of......Ann 8, II, p 985; Mon XIII, pp 55, 438–450
Quicksilver ores of the Pacific slope, mineralogical character of the.......Mon XIII,
pp 388–394
Quicksilver ores, solution and precipitation of..Mon XIII, pp 269–270, 419–437, 473–474
Quicksilver reduction at New Almaden, California..........MR 1883–84, pp 503–536
Quicksilver, South American localities of..............................Mon XIII, pp 19–24
Quicksilver, statistics of..MR 1882, pp 387–398;
MR 1883–84, pp 492–536; MR 1885, pp 284–295; MR 1886, pp 160–168; MR 1887, pp 118–125; MR 1888, pp 97–107; MR 1889–90, pp 94–109; MR 1891, pp 117–125
Quicksilver, uses, relative value, principal districts, total product, etc., of..Mon XIII, pp 1–13, 451–452
Raborg (W. A.), buhrstones, statistics of..........................MR 1886, pp 581–582
Raborg (W. A.), corundum, statistics of...........................MR 1886, pp 585–586
Raborg (W. A.), graphite, statistics of............................MR 1886, pp 686–689
Raborg (W. A.), grindstones, statistics of.........................MR 1886, pp 582–585
Raborg (W. A.), salt, statistics of...................................MR 1886, pp 628–641;
MR 1887, pp 611–625; MR 1888, pp 597–612; MR 1889–90, pp 482–492
Rails, iron and steel, twenty years of changes in the manufacture of......MR 1891,
pp 62–65

Rainfall measurements....Ann 11, II, pp 23–30
Rainfall of western United States....Ann 11, II, pp 214–215
Rainfall. See, also, Hydrography.
Ralstonite from near Pike's peak, Colorado....Bull 20, p 56
Raritan clays and greensand marls of New Jersey, Brachiopoda and Lamellibranchiata of the....Mon IX
Raritan clays and greensand marls of New Jersey, Gasteropoda and Cephalopoda of the....Mon XVIII
Rattlesnake mountains, Wyo., literature of the geology of the....Bull 86, 278
Raymond (R. W.), historical sketch of mining law....MR 1883–84, pp 988–1004
Raymond (R. W.), the divining rod....MR 1882, pp 610–626
Read (M. C.), Berea grit....MR 1882, pp 478–479
Recession of cliffs....Ann 2, p 58; Mon II, pp 250–260
Reconnaissance, a geological, in southern Oregon....Ann 4, pp 431–464
Record of North American geology. See Bibliography.
Reconnaissance, a geological, in southwestern Kansas....Bull 57
Red color of certain formations, origin of the, and subaërial decay of rocks..Bull 52
Red Creed quartzite of Wyoming....Bull 86, pp 287–289
Requisite and qualifying conditions of artesian wells....Ann 5, pp 125–173
Reservoir sites and canal lines of Snake river basin....Ann 11, II, pp 190–200
Reservoir sites and canal lines in Montana surveyed for irrigation purposes....Ann 11, II, pp 113–133; Ann 12, II, pp 127–165
Reservoir sites and canal lines in Nevada surveyed for irrigation purposes....Ann 11, II, pp 168–183; Ann 12, pp 45, 209–212
Reservoir sites, canals, and irrigable lands in New Mexico....Ann 11, II, pp 145–150; Ann 12, II, pp 165–209
Reservoir sites in Colorado surveyed for irrigation purposes....Ann 11, II, pp 133–144; Ann 12, II, pp 55–127
Reservoir sites segregated in California...Ann 11, II, pp 150–168; Ann 12, II, pp 10–54
Reservoir system of Utah lake....Ann 11, II, pp 184–189
Reservoirs. See Irrigation.
Residual clays, characteristics of....Bull 52, p 39
Residual deposit from subaërial decay of chloritic schist from eight miles west of Cary, North Carolina, analysis of....Bull 42, p 137
Residual products from the decay of rocks....Bull 52, pp 12–43
Residuary products of erosion in the driftless area of the upper Mississippi, character and constitution of....Ann 6, pp 239–258
Resin, a supposed mineral, from Livingston, Montana, description and analysis of....Bull 78, pp 105–108
Resorption of quartz crystals in basalt....Bull 79, p 25
Rhætic formation in Virginia....Mon XV, pp 34, 58
Rhætic of Germany and France and the Triassic of United States, parallelism of the....Mon XIV, pp 10–11, 13
Rhætic plants, or those nearly allied to such, from the Mesozoic of Virginia and North Carolina....Mon VI
Rhætic. See, also, Jura-trias.
Rhizopoda from the lower Silurian of the Eureka district....Mon VIII, pp 65–67
Rhode Island, altitudes in....Bull 5, p 275; Bull 76
Rhode Island, boundary lines of....Bull 13, pp 65–66
Rhode Island, brick industry of....MR 1887, pp 536, 539
Rhode Island, building stone from, statistics of....MR 1882, p 451; MR 1887, p 513; MR 1888, p 536; MR 1889–90, pp 373, 427–428; MR 1891, pp 457, 460, 464, 467
Rhode Island, clay production of....MR 1891, p 502
Rhode Island, coal area and statistics of....Ann 2, p xxviii; MR 1883–84, pp 12, 87; MR 1885, p 11; MR 1886, p 224; MR 1887, pp 169, 351–352; MR 1888, pp 169, 171, 361

Rhode Island; coal from Cranston, analysis of........Bull 9, p 18
Rhode Island, fossils from........Ann 8, II, p 853
Rhode Island, geologic and paleontologic investigations in........Ann 6, pp 19–20; Ann 9, pp 72, 76; Ann 10, I, p 118; Ann 11, I, p 63; Ann 12, I, p 66
Rhode Island, geologic maps of, listed........Bull 7, pp 53, 54, 55
Rhode Island, glacial investigations in........Ann 3, pp 377, 380; Ann 7, p 157
Rhode Island, granite production of........MR 1891, pp 457, 460
Rhode Island; graphitic carbon mine near Cranston........MR 1886, p 686
Rhode Island, iron and steel from, statistics of....MR 1882, pp 120, 125, 133, 134, 135; 1886, pp 17, 42–43; MR 1887, p 11; MR 1888, p 14; MR 1891, p 61
Rhode Island, limestone production of........MR 1891, pp 464, 467
Rhode Island, mineral springs of.....Bull 32, p 24; MR 1885, p 540; MR 1886, p 718; MR 1887, p 685; MR 1888, p 628; MR 1889–90, p 532; MR 1891, pp 603, 607
Rhode Island, minerals of, the useful........MR 1882, p 727; MR 1887, pp 785–786
Rhode Island surveyed by coöperation of the state..Ann 9, p 51; Ann 10, I, pp 7, 85–86
Rhyolite, analyses of........Ann 8, I, p 380
Rhyolite from Washoe, Nevada, analysis of........Bull 27, p 66
Rhyolite from Yellowstone national park, fayalite in........Ann 7, p 270
Rhyolite of the Bonneville basin, age of the........Mon I, p 337
Rhyolite of the Eureka district, Nevada........Mon XX, pp 237, 374–385
Rhyolite of the Mosquito range, Colorado........Mon XII, pp 87, 345–352
Rhyolite, pumiceous, analysis of........Mon XI, p 147
Rhyolite, topaz in........Mon XII, p 347; Bull 20, p 81
Rhyolites, lustre exhibited by sanidine in certain........Bull 20, pp 75–80
Rhyolites of the Tewan mountains, New Mexico........Bull 62, pp 10–12
Richthofen (F.), quoted on the Comstock lode........Mon III, pp 12–24
Rifting in the rocks of cape Ann, Massachusetts........Ann 9, pp 602–605
Riggs (R. B.), analysis and composition of tourmaline........Bull 55, pp 19–37
Riggs (R. B.), two new meteoric irons and an iron of doubtful nature......Bull 42, pp 94–97
Rigidity of the earth, considerations concerning the, derived from a study of lake Bonneville........Mon I, pp 387–392
Rio Grande, Pleistocene origin of the........Ann 12, I, pp 517–518
Rio Grande basin, hydrography of the........Ann 11, II, pp 52–57, 99, 107; Ann 12, II, pp 240–290
Rio Grande basin, irrigation problems relating to the........Ann 11, II, pp 215–227
Rio Grande basin, surveys for reservoir sites and canals in the..Ann 11, II, pp 145–150
Rio Grande valley, water supply of the........Ann 12, II, pp 277–278
River courses in Washington territory, changes in, due to glaciation........Bull 40
River courses. See, also, Drainage.
River water, general chemistry of........Mon XI, pp 172–174
River waters, analyses of........Mon XI, p 176; Bull 52, p 38; Bull 55, pp 91–93
Rivers, origin and persistence of........Ann 2, pp 60–61; Mon II, pp 72, 219
Rizer (H. C.), appointment of, to office of chief clerk........Ann 12, I, p 19
Rock builders, plants as........Ann 9, p 619
Rock constituents, decomposition of........Mon III, pp 214–215, 369–372
Rock, eruptive, from Bear creek, Montana, analysis of........Bull 78, p 123
Rock, eruptive, from New Mexico, analyses of........Bull 27, pp 64–65
Rock, eruptive, from the Henry mountains, Utah, analysis of........Bull 60, p 154
Rock, ferruginous, from Penokee iron range, Wisconsin, analysis of...Bull 42, p 138
Rock formations of the Leadville district, Colorado, general description of the........Ann 2, pp 215–224; Mon XII, pp 45–89, 276–284, 292–362
Rock phosphates, classes, nature, and localities of........Bull 46, pp 59–116
Rock phosphates. See, also, Phosphates.
Rock-scorings of the great ice-invasions........Ann 7, pp 147–248
Rock structures, importance of understanding the significance of......Bull 62, p 196

Rock structures produced by dynamic action.................... Bull 62, pp 206–208

Rock temperatures of Comstock lode, Nevada.................... Mon III, pp 246–258

Rockingham group of rocks in New Hampshire.................... Bull 86, pp 353–355

Rocks as the source of soils.......................... Ann 12, I, pp 293–296, 300–306

Rocks, chemical alteration of.. Bull 52, p 37

Rocks, chemical analysis of, separation of titanium, chromium, aluminum, iron, barium, and phosphoric acid.......................... Bull 78, pp 87–90

Rocks, educational series of, and bulletin to accompany the same, progress of the preparation of the.............................. Ann 12, I, pp 102–103

Rocks, eruptive, from Electric peak and Sepulchre mountain, Yellowstone park, mineral and chemical composition of the.. Ann 12, I, pp 619–632, 647–650

Rocks from California, analyses of.............................. Bull 55, pp 84–85

Rocks from Kakabikka falls, Kaministiquia river, Ontario, Canada, analyses of.. Bull 42, p 139

Rocks from Menominee river, Michigan and Wisconsin, analyses of.... Bull 55, p 81

Rocks from Montana, analyses of............. Bull 55, pp 83–84; Bull 60, pp 152–154

Rocks from Pigeon point, Minnesota, analyses of.................. Bull 55, pp 81–83

Rocks from sandstone dikes of northern California and from the Diablo, analyses of.. Bull 78, pp 123–124

Rocks from Tewan mountains, New Mexico, analyses of............... Bull 60, p 155

Rocks from Wisconsin, Michigan, and Minnesota, analyses of.... Bull 60, pp 149–151

Rocks, miscellaneous, analyses of........... Bull 9, pp 9–18; Bull 27, pp 63-66; Bull 42, pp 136–144; Bull 52, pp 18, 24; Bull 55, pp 80–85; Bull 60, pp 149–160; Bull 62, pp 89, 91, 103, 104, 113, 119–121, 152–153; Bull 64, pp 41–50; Bull 66, p 30; Bull 78, pp 90, 116–117, 121–125; Bull 79, p 29; MR 1883–84, p 969; MR 1886, pp 542, 543, 547, 583; MR 1887, p 588; MR 1888, p 537

Rocks of the Washoe district, Nevada, nature and decomposition of the.... Mon III, pp 32–80, 372–376

Rocks, physical constants of, investigations into the................ Ann 3, pp 3–9

Rocks, primeval, possible character of the..................... Mon XIII, pp 171–173

Rocks, sedimentary and massive, of the Pacific slope... Mon XIII, pp 56–175, 453–460

Rocks, stratified, of mount Desert island, Maine............. Ann 8, II, pp 1037–1047

Rocks, subaërial decay of, and origin of the red color of certain formations.. Bull 52

Rocks, the copper-bearing, of lake Superior.............................. Mon V

Rocks. See, also, Igneous; Petrography; Sedimentary.

Rocky mountain province, literature and fauna of the lower Cambrian in the... Ann 10, I, pp 537–538, 542–543, 571, 584–586

Rocky mountains, contributions to the mineralogy of the.................. Bull 20

Rocky mountains in Colorado, structure of the.................. Mon XII, pp 19–27

Rocky mountains. See, also, Colorado; Montana; New Mexico; Wyoming.

Rolling-mill development, twenty years of..................... MR 1891, pp 60–62

Roots as agents of soil formation.......................... Ann 12, I, pp 269–274

Rothwell (R. P.), pyrites, statistics of..................... MR 1886, pp 650–675

Rottenstone, statistics of.. MR 1883–84, p 722

Ruffner (W. H.), the coal fields of Washington............... MR 1891, pp 334–341

Rühlmann (R.), hypsometric method of.......................... Ann 2, pp 550–552

Russell (I. C.), existing glaciers of the United States............ Ann 5, pp 303–355

Russell (I. C.), explorations in Alaska........ Ann 11, I, pp 57–58; Ann 12, I, pp 59–61

Russell (I. C.), geological history of lake Lahontan...... Ann 3, pp 189–235; Mon XI

Russell (I. C.), geological reconnaissance in southern Oregon..... Ann 4, pp 431–464

Russell (I. C.), Newark system, a correlation essay.......................... Bull 85

Russell (I. C.), Quaternary history of Mono valley, California.. Ann 8, I, pp 261–394

Russell (I. C.), subaërial decay of rocks and origin of the red color of certain formations... Bull 52

Russia, coal area and output of, compared with those of other countries...**MR 1882, p 5; MR 1883–84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73**

Russia, copper production of...**MR 1882, p 257; MR 1883–84, p 356; MR 1885, pp 228, 241–242; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1889–90, p 73; MR 1891, p 100**

Russia, fauna of the Olenellus zone in...**Ann 10, I, pp 579–580**

Russia, fossil plants of, literature of the...**Ann 8, II, pp 781–785**

Russia, gold and silver production of, compared with that of other countries...**MR 1883–84, pp 319, 320**

Russia, iron and steel production of, compared with that of other countries...**MR 1882, p 109; MR 1883–84, p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889–90, pp 21, 22; MR 1891, p 73**

Russia, lead production of...**MR 1883–84, p 434; MR 1885, pp 264, 270**

Russia, manganese production of...**MR 1886, pp 204–205; MR 1887, p 161; MR 1888, p 141; MR 1891, p 146**

Russia, mining law of...**MR 1883–84, p 1002**

Russia, petroleum production of...**MR 1883–84, pp 231–232; MR 1886, pp 463–478; MR 1887, pp 458–463; MR 1888, pp 478–480**

Russia, phosphates of...**Bull 46, pp 112–116**

Russia, phosphorous production of...**MR 1886, pp 676–677**

Russia, platinum mines and production of...**MR 1882, p 443; MR 1883–84, p 576; MR 1885, pp 367–368; MR 1888, p 165; MR 1889–90, p 143**

Russia, quicksilver deposits in...**Mon XIII, p 43**

Russia, quicksilver production of...**MR 1888, p 105; MR 1891, pp 123, 124**

Russia, tin production of...**MR 1883–84, p 619**

Russia, zinc production of...**MR 1883–84, p 480; MR 1885, pp 277, 283; MR 1886, p 159; MR 1887, p 117; MR 1888, p 95**

Ryder (J. A.), life-history of the oyster...**Ann 4, pp 317–333**

Sacramento and San Joaquin basins, California, hydrography of the...**Ann 12, II, pp 316–324**

Saline contents of Great salt lake...**Mon I, pp 251–258**

Saline efflorescences of Lahontan basin...**Mon XI, pp 230–232**

Salines and refineries in California...**MR 1882, pp 570–571**

Salines of Louisiana...**MR 1882, pp 554–565**

Salisbury (R. D.) and Chamberlin (T. C.), driftless area of the upper Mississippi valley...**Ann 6, pp 199–322**

Salt, analyses of...**Bull 55, p 88; Bull 60, p 171; MR 1882, pp 555, 557, 564; MR 1883–84, pp 834, 840, 841, 849; MR 1885, 479, 482; MR 1888, p 619**

Salt deposits of Sevier basin and Snake valley, Utah...**Mon I, pp 223–228**

Salt deposits of inclosed basins...**Mon XI, pp 84–86**

Salt, foreign commerce in...**MR 1882, pp 550–553; MR 1883–84, pp 848–849**

Salt from Hutchinson, Kansas, analysis of...**Bull 60, p 171**

Salt from Warsaw, New York, analysis of...**Bull 55, p 88**

Salt in Kansas...**Bull 57, pp 25–26, 48**

Salt-making processes in the United States...**Ann 7, pp 491–535**

Salt; salines of Louisiana...**MR 1882, pp 554–565**

Salt, statistics of...**MR 1882, pp 532–565; MR 1883–84, pp 827–850; MR 1885, pp 474–485; MR 1886, pp 628–641; MR 1887, pp 611–625; MR 1888, pp 597–612; MR 1889–90, pp 482–492; MR 1891, pp 572–578**

Salt-works in the Lahontan basin...**Ann 3, pp 226–227; Mon XI, pp 232–235**

Salt lake basin, fresh waters in, analyses of...**Mon I, p 207**

Salt lake basin, hydrography of...**Ann 11, II, pp 66–77, 109**

Salt lake, Great, analysis of the water of...**Mon I, pp 253, 254, 255**

Salt lake, Great, saline deposits of...**Mon XI, pp 185–186**

Salt lake, Great, surveys, oscillations, fauna, etc., of........Mon I, pp 230–259

Salt lake group of rocks of Idaho........Bull 84, pp 286–287

Salt river basin, Arizona, hydrography of........Ann 11, II, pp 61–63, 100

Salts deposited on evaporation........Mon XI, pp 182–187

Samarskite from Colorado........Bull 55, pp 48–51

San Francisco district, Utah, reconnaissance of the........Ann I, pp 37–38

San Joaquin and Sacramento basins, California, hydrography of the.....Ann 12, II, pp 316–324

San Luis valley, Colorado, hydrography and irrigation in........Ann 11, II, p 146; Ann 12, II, pp 247–251

San Pedro river basin, Arizona, hydrography of........Ann 11, II, pp 59–61, 99

Sand, building, statistics of........MR 1883–84, pp 667–668; MR 1885, pp 404–405

Sand dunes, constitution of........Mon I, p 59

Sand dunes in the Great basin........Mon XI, pp 153–156

Sand dunes of cape Ann district, Massachusetts........Ann 9, pp 574–575

Sands, æolian, of lake Lahontan basin........Mon XI, pp 153–156

Sands, glass, analyses of........MR 1883–84, p 962

Sands, green, analyses of........MR 1883–84, p 798

Sandstone, analysis of, from Arizona, Flagstaff........Bull 78, p 124

Sandstone, analysis of, from Colorado, Armejo quarry and Boulder county..Bull 42, p 141; MR 1889–90, p 384

Sandstone, analysis of, from Massachusetts, Maynard, Worcester, and Kibbe........MR 1889–90, p 402

Sandstone, analysis of, from Michigan........Bull 27, p 66

Sandstone, analysis of, from Ohio, various localities........Bull 27, p 66; Bull 60, p 158; MR 1889–90, p 416

Sandstone, analysis of, from Pennsylvania, Luzerne, Blair, and Fayette counties........MR 1889–90, pp 419–420

Sandstone from South Dakota, tests of........MR 1889–90, p 429

Sandstone, induration of........Bull 8, I, pp 12–18, 48–52

Sandstone, origin of concretions in........Mon XIII, pp 64–68

Sandstone, secondary enlargement of mineral fragments in........Ann 5, pp 218–241

Sandstone, secondary enlargement of quartz and feldspar grains in..Bull 8, pp 11, 44

Sandstone, statistics of........MR 1882, pp 451, 457; MR 1886, pp 546–549; MR 1887, pp 520–521; MR 1888, pp 544–547; MR 1889–90, pp 374–375; MR 1891, pp 456, 460–463

Sandstone, the Eastern, junction between the, and the Keweenaw series on Keweenaw point, lake Superior, observations on the........Bull 23

Sandstone, transformation of, to serpentine........Mon XIII, pp 121–126, 277–278

Sandstone, Triassic, from near Hancock, Maryland, analysis of........Bull 55, p 80

Sandstones, Cretaceous, of the Coast ranges of California, metamorphism of....Mon XIII, pp 63, 87–93

Sandstones, metamorphosed, of the Eureka district, Nevada........Mon XX, p 346

Sandstones of the Coast ranges of California, petrography of the..Mon XIII, pp 59–63

Sandstones of the Keweenaw series........Mon V, pp 127–133

Sandstones, origin of the red color of........Bull 52, pp 44–55

Sandwich islands. See Hawaiian.

Sangre de Cristo and Wet mountains, Colo., geology of the......Bull 86, pp 313–314

Sanidine, lustre of, in nevadite........Mon XII, p 348

Sanidine in certain rhyolites, lustre exhibited by........Bull 20, pp 75–80

Sanitary conditions of soils........Ann 12, I, pp 340–344

Santa Fé district, New Mexico, irrigation in the........Ann 11, II, pp 149, 219, 224; Ann 12, II, pp 269–270

Santee beds of South Carolina........Bull 83, pp 52–53

Saporta (Marquis Gaston de), biographical sketch of........Ann 5, pp 383–384

Sapphire. See Precious stones.
Saussurite from Shasta county, California, analysis of .... Bull 9, p 10
Saussuritization, a kind of mineralogical metamorphism .... Bull 62, pp 58–60
Sawatch mountains, Colo., Archean and Algonkian rocks of the .... Bull 86, p 316
Schenk (August), biographical sketch of .... Ann 5, pp 382–383
Scheuchzer (Johann Jacob), biographical sketch of .... Ann 5, p 370
Schimper (Wilhelm Philipp), biographical sketch of .... Ann 5, pp 375–376
Schist areas, the greenstone, of the Menominee and Marquette regions of Michigan, a contribution to the subject of dynamic metamorphism in eruptive rocks .... Bull 62
Schistose rocks, relation of, to massive rocks in Wisconsin .... Ann 10, I, p 363
Schistose structure in relation to pressure .... Bull 59, p 43
Schists, crystalline, of the lake Superior region .... Ann 10, I, pp 355–364
Schists, metamorphic, of the Penokee iron-bearing series, origin of the .... Mon XIX, pp 107–111, 116–126
Schlotheim (Ernst Friederich, Baron von), biographical sketch of .... Ann 5, pp 370–371
Schneider (E. A.), on the colloidal sulphides of gold .... Bull 90, pp 56–61
Schneider (E. A.) and Clarke (F. W.), on the constitution of certain micas, vermiculites, and chlorites .... Bull 90, pp 11–21
Schneider (E. A.) and Clarke (F. W.), experiments upon the constitution of the natural silicates .... Bull 78, pp 11–33
Schwatka (F.), exploration of the Yukon valley, etc., by .... Ann 12, I, p 62
Scolecite from Table mountain, Colo., description and analyses of .... Bull 20, pp 36–37
Scorings, rock, of the great ice invasions .... Ann 7, pp 147–248
Scorodite from Steamboat springs, Nevada .... Bull 60, p 30
Scorodite from the Yellowstone national park .... Bull 55, pp 65–66
Scotland, fossil plants of, literature of the .... Ann 8, II, pp 684–687
Scotland. See, also, Great Britain.
Scudder (S. H.), administrative report for 1885–86 .... Ann 7, p 127
Scudder (S. H.), administrative report for 1886–87 .... Ann 8, I, pp 188–189
Scudder (S. H.), administrative report for 1887–88 .... Ann 9, p 133
Scudder (S. H.), administrative report for 1888–89 .... Ann 10, I, p 176
Scudder (S. H.), administrative report for 1889–90 .... Ann 11, I, pp 123–125
Scudder (S. H.), administrative report for 1890–91 .... Ann 12, I, pp 125–127
Scudder (S. H.), classed and annotated bibliography of fossil insects .... Bull 69
Scudder (S. H.), fossil butterflies of Florissant .... Ann 8, I, pp 433–474
Scudder (S. H.), index to the known fossil insects of the world, including myriapods and arachnids .... Bull 71
Scudder (S. H.), some insects of special interest from Florissant, Colorado, and other points in the Tertiaries of Colorado and Utah .... Bull 93
Scudder (S. H.), systematic review of our present knowledge of fossil insects, including myriapods and arachnids .... Bull 31
Sea-coast swamps of eastern United States .... Ann 6, pp 353–398
Sea-level, the form and position of the .... Bull 48
Secondary enlargements of amphibole and pyroxene in diabase .... Mon XIX, pp 353, 354, 411–413
Secondary enlargements of mineral fragments in certain rocks .... Bull 8
Secret canyon shale at Eureka, Nevada .... Mon XX, p 39
Sedimentary rocks, assimilation of, by igneous magmas .... Mon XII, pp 308–313
Sedimentary rocks; chemical deposits of lake Lahontan .... Mon XI, pp 188–222
Sedimentary rocks; chert in limestone, origin of .... Ann 10, I, pp 367–369
Sedimentary rocks; chlorine in dolomite .... Mon XII, p 279
Sedimentary rocks; concretions in sandstone, origin of .... Mon XIII, pp 64–68
Sedimentary rocks, dolomitic, discussion of .... Mon XII, p 276
Sedimentary rocks, induration of, by enlargement of mineral fragments .... Bull 8, pp 13–17

Sedimentary rocks; limestone, decay of .... Bull 52, pp 20-25

Sedimentary rocks of the Coast ranges of California .... Mon xiii, pp 56-139

Sedimentary rocks of the Eureka district, Nevada .... Mon xx, pp 34-98

Sedimentary rocks of the Keweenaw series .... Mon v, pp 127-133, 151

Sedimentary rocks of the Leadville district, Colorado .... Ann 2, pp 225-226; Mon xii, pp 45-73, 276-281

Sedimentary rocks of the Penokee series .... Ann 10, i, pp 365-402, 423-435, 439-444

Sedimentary rocks; origin of the red color of sandstones, etc .... Bull 52, pp 44-55

Sedimentary rocks; quartzites, genesis of .... Bull 8, pp 11-43, 48-52

Sedimentary rocks; residual clays, characteristics of .... Bull 52, p 39

Sedimentary rocks. See, also, Limestone; Marl; Quartzite; Sandstone; Tufa.

Sedimentation. See Deposition.

Sediments, lacustral, of Mono lake, California .... Ann 8, i, pp 305-310

Sediments of lake Bonneville, chemical analyses of ... Ann 2, p 177; Mon i, pp 201-202

Sediments of lake Lahontan .... Mon xi, pp 124-156

Seismology. See Earthquakes.

Selkirk range, comparative table of formations met with in the, and the eastern border of the interior plateau of British Columbia and on the western side of the adjacent portion of the Rocky mountains .... Bull 86, p 340

Senonian, Laramie, and Eocene plants, table of distribution of, and discussion thereof .... Ann 6, pp 443-536

Sepulchre mountain and Electric peak, Yellowstone national park, the eruptive rocks of .... Ann 12, i, pp 569-664

Sericitization, a kind of mineralogical metamorphism .... Bull 62, pp 60-62

Serpentine, analyses of .... Mon xii, p 598; Mon xiii, pp 110, 111

Serpentine and its associates, analyses of .... Bull 64, pp 43-44

Serpentine and pyroxene from Montville, New Jersey, description and analyses of .... Bull 60, p 137

Serpentine and serpentinization, especially in the Coast ranges of California .... Mon xiii, pp 108-128, 251, 276-278, 293, 311, 359, 457-458

Serpentine, decomposition of .... Mon xiii, pp 127-128

Serpentine from Harford county, Maryland, analysis of .... MR 1889-90, p 400

Serpentine from Newburyport, Massachusetts, analysis of .... Bull 27, p 63

Serpentine, microstructure of .... Mon xiii, pp 114-117

Serpentine of the Lassen peak district, California .... Ann 8, i, p 405

Serpentine of the Mosquito range, Colorado .... Mon xii, pp 281-284

Serpentine, origin of .... Mon xii, pp 282-284; Mon xiii, pp 117-126

Serpentine near Baltimore, Maryland, origin of .... Bull 28, pp 56-58

Serpentine, pseudomorphic .... Mon xiii, pp 123-126

Serpentinization, character of .... Mon xiii, pp 120-127

Severn formation .... Ann 12, i, p 421

Sevier lake, Utah, analyses of the products and brine of .... Mon i, p 227

Sevier river basin, Utah, hydrography of .... Ann 11, ii, pp 74-77, 105; Ann 12, ii, pp 339-344

Shaler (N. S.), administrative report for 1884-85 .... Ann 6, pp 18-22

Shaler (N. S.), administrative report for 1885-86 .... Ann 7, pp 61-65

Shaler (N. S.), administrative report for 1886-87 .... Ann 8, i, pp 125-128

Shaler (N. S.), administrative report for 1887-88 .... Ann 9, pp 71-74

Shaler (N. S.), administrative report for 1888-89 .... Ann 10, i, pp 117-119

Shaler (N. S.), administrative report for 1889-90 .... Ann 11, i, pp 62-64

Shaler (N. S.), administrative report for 1890-91 .... Ann 12, i, pp 66-67

Shaler (N. S.), fresh-water morasses of the United States, with description of the Dismal swamp .... Ann 10, i, pp 255-339

Shaler (N. S.), geology of cape Ann, Massachusetts .... Ann 9, pp 529-611

Shaler (N. S.), geology of Martha's vineyard .... Ann 7, pp 297-360

Shaler (N. S.), geology of mount Desert, Maine.................Ann 8, II, pp 987–1061
Shaler (N. S.), geology of Nantucket..Bull 53
Shaler (N. S.), introduction to Penrose's "Nature and origin of deposits of phosphate of lime"..Bull 46, pp 9–20
Shaler (N. S.), sea-coast swamps of eastern United States.........Ann 6, pp 353–398
Shaler (N. S.), the origin and nature of soils.....................Ann 12, I, pp 213–345
Shasta, mount, topographical sketch of...........................Ann 5, pp 330–340
Sheavwits plateau, Grand canyon district, description of the......Ann 2, pp 72, 126; Mon II, pp 10, 101
Shiloh marls, stratigraphy and correlation of the.................Bull 84, pp 40–43
Shipbuilding, iron and steel, twenty years of......................MR 1891, pp 68–69
Shore features, formations, and phenomena....Ann 2, pp 171–172; Ann 3, pp 204–208; Ann 5, pp 69–123; Mon I, pp 23–89; Mon XI, pp 87–99
Shoreline of Martha's vineyard, recent changes in the............Ann 7, pp 361–363
Shoreline, Paleozoic, of the Great basin..........................Mon XX, pp 175–177
Shorelines of mount Desert, Maine..............................Ann 8, II, pp 1009–1034
Shutt (G. W.), administrative report for 1883–84.......................Ann 5, pp 64–66
Shutt (G. W.), administrative report for 1884–85..............................Ann 6, p 93
Shutt (G. W.), administrative report for 1885–86.....................Ann 7, pp 135–136
Shutt (G. W.), administrative report for 1886–87.................Ann 8, I, pp 201–202
Siberia, fossil plants of, literature of the............................Ann 8, II, pp 786–788
Siberia, quicksilver deposits of...Mon XIII, pp 44–46
Sicilian asphaltum, statistics of...MR 1891, p 455
Sicilian sulphur industry..MR 1891, p 570
Sierra nevada, Coast, and Cascade ranges, relation of the.............Bull 19, p 20; Bull 33, pp 19–20
Sierra nevada range, structure of the........Ann 8, I, pp 426–428; Bull 33, pp 12–15
Sierra nevada. See, also, California; Nevada.
Sierra, the high, in California, description of ....Ann 8, I, pp 321–324
Silesia, zinc production of...MR 1891, pp 113–114
Silica and alkali determinations in eruptive rocks ....Mon XII, p 590
Silica, source of, in ferruginous cherts...........................Ann 10, I, pp 398–399
Silicates, alkalies in, estimation of...Bull 9, pp 36–37
Silicates, fusibility of ....Bull 26, pp 50–52
Silicates, the natural, experiments upon the constitution of ....Bull 78, pp 11–33
Silicates, the natural, the chemical structure of ....Bull 60, pp 13–20
Siliceous sinter, formation of, by the vegetation of hot springs.........Ann 9, p 613
Siliceous sinter, nature of ....Ann 9, pp 669–676
Siliceous sinter of New Zealand ....Ann 9, pp 672–676
Siliceous sinter of Yellowstone national park ....Ann 9, p 650
Siliceous sinter, origin of ....Ann 9 pp 650, 655–657
Siliceous sinter, rate of deposition of...Ann 9, p 666
Silicic acid, the action of phosphorus oxychloride on the ethers and chlorhydrines of ....Bull 90, pp 47–55
Silicification.....................................Mon XIII, pp 137, 392–394; Bull 19, p 8
Silicon in steel..Bull 25, p 13
Silicon, use of, in preventing blowholes in steel ....Bull 25, pp 67–68
Silurian fauna of the Eureka district, Nevada ......Mon XX, pp 49–54, 59–62, 191–192
Silurian fossils of the Eureka district, Nevada...................................Mon VIII, pp 65–98, 270–273; Mon XX, pp 322–325
Silurian rocks containing bitumen deposits ....Ann 11, I, pp 600, 625–634
Silurian rocks, enlargements in ....Bull 8, pp 41–42
Silurian rocks in northeastern Iowa..................................Ann 11, I, pp 323–333
Silurian rocks in the Leadville district, Colorado................................Ann 2, p 218
Silurian rocks in the upper Missouri region ....Ann 6, pp 50–51

Silurian rocks of Texas .... Bull 45, pp 55–56, 87
Silurian rocks of the Eureka district, Nevada... Ann 3, pp 260–263; Mon xx, pp 34–62
Silurian rocks of the lake Superior region .... Ann 3, pp 147–155
Silurian rocks of the Mosquito range, Colorado.................... Mon xii, pp 60–63
Silurian; Trenton limestone as a source of petroleum and inflammable gas in Ohio and Indiana.................... Ann 8, ii, pp 475–662
Silurian; Uinta sandstone in northwestern Colorado.................... Ann 9, pp 687–688
Silurian, upper, fishes of the.................... Mon xvi, pp 19–20
Silurian. See, also, Paleozoic.
Silver, discovery of, in western United States .... Mon iii, pp 26–28
Silver in country rocks, determination of .... Ann 6, pp 345–348
Silver, quantitative determination of, by means of the microscope.. Ann 6, pp 323–352
Silver and gold conversion tables .... Bull 2
Silver and gold, discovery of, in Colorado.................... Mon xii, pp 7–10
Silver and gold in eruptive rocks.................... Mon xii, p 579
Silver and gold in the United States, production of, since 1804 .... MR 1888, p 38
Silver and gold in the United States since 1792, product of........ MR 1891, pp 74–75
Silver and gold of the Comstock lode, Nevada... Mon iii, pp 6–7, 9, 18, 224–225, 268
Silver and gold, statistics of.......... Ann 1, p 73; Ann 2, pp 331–401; MR 1882, pp 172–185; MR 1883–84, pp 312–321; MR 1885, pp 200–207; MR 1886, pp 104–108; MR 1887, pp 58–65; MR 1888, pp 36–42; MR 1889–90, pp 48–55; MR 1891, pp 74–80
Silver and gold, the world's production of.................... MR 1883–84, pp 319–321; MR 1888, p 40; MR 1889–90, p 54
Silver-lead deposits of Eureka, Nevada.................... Mon vii
Silver-lead deposits of the Leadville district, Colorado .... Mon xii, pp 367–584
Silver salts, the indirect estimation of chlorine, bromine, and iodine by the electrolysis of their, with experiments on the convertibility of the silver salts by the action of alkaline haloids.................... Bull 42, pp 89–93
Sinter, algous .... Ann 9, p 665
Sinter at Steamboat springs, Nevada.................... Mon xiii, p 341
Sinter, dendritic.................... Mon xiii, pp 266–268
Sinter from Queensland, analysis of.................... Bull 90, p 74
Sinter, moss.................... Ann 9, p 667
Sinter, siliceous, formation of, by the vegetation of hot springs........ Ann 9, p 613
Sinter, siliceous, nature of.................... Ann 9, pp 669–676
Sinter, siliceous, of New Zealand.................... Ann 9, pp 672–676
Sinter, siliceous, of Yellowstone national park.................... Ann 9, p 650
Sinter, siliceous, origin of.................... Ann 9, pp 650, 655–657
Sinter, siliceous, rate of deposition of.................... Ann 9, p 666
Sioux quartzites, relations of the, to the Huronian.................... Bull 86, pp 186–187
Sioux reservation, lignites of the great.................... Bull 21
Slag, blast-furnace, utilization of.................... MR 1882, pp 161–164
Slags, lead, statistics of.................... MR 1883–84, pp 440–462
Slags of Leadville, analyses and composition of the............ Mon xii, pp 698–709
Slate member of the Penokee iron-bearing series, origin and petrographical character of the.................... Ann 10, i, pp 370–379; Mon xix, pp 302–345
Slate series, auriferous, of the Lassen peak district, California.. Ann 8, i, pp 404–407
Slate, statistics of.................... MR 1882, p 457; MR 1883–84, p 929; MR 1885, pp 398–401, 532–533; MR 1886, pp 549–553; MR 1887, pp 522–527; MR 1888, pp 547–551; MR 1889–90, p 376; MR 1891, pp 456, 472–473
Slates from the Penokee district of Mich. and Wis., analyses of ..... Mon xix, p 306
Sloan (E.), investigations relating to the Charleston earthquake............ Ann 9, pp 210, 294–295, 297, 305, 312
Smelting, copper .... Bull 26
Smelting, materials used in.................... Mon xii, pp 636–659

Smelting at Leadville, Colorado........Mon xii, pp 609–751
Smelting of argentiferous lead in the far West........MR 1882, pp 324–345
Smelting, products of........Mon xii, pp 692, 731
Smith (E. A.), list of ores, minerals, and mineral substances of industrial importance in Alabama........MR 1882, pp 667–670
Smith (E. A.), the iron ores of Alabama in their geological relations........MR 1882, pp 149–161
Smith (E. A.) and Johnson (L. C.), Tertiary and Cretaceous strata of the Tuscaloosa, Tombigbee, and Alabama rivers........Bull 43
Smith (W. B.), notes upon the occurrence of topaz at Devil's head mountain, Colorado........Bull 20, pp 73–74
Smithsonite from Arkansas, analysis of........Bull 90, p 62
Smock (J. C.), lists of ores, minerals, and mineral substances of industrial importance in several of the states........MR 1882, pp 665–747
Smoky mountains, Tenn., literature of the geology of the........Bull 86, pp 421, 422
Snake River basin, hydrography of........Ann 11, ii, pp 77–92, 106, 110; Ann 12, ii, p 344
Snake River basin, reservoir sites and canal lines surveyed in, for irrigation purposes........Ann 11, ii, pp 190–200
Snake River valley, irrigation problems in the........Ann 11, ii, p 239
Soapstone, statistics of........MR 1891, p 593
Soapstone and diabases from the Penokee district of Mich. and Wis..Mon xix, p 357
Soda, analyses of........Bull 60, pp 27–101; MR 1882, pp 601, 602, 603, 604; MR 1885, pp 546, 551, 553, 554; MR 1887, p 655
Soda ash, analyses of........MR 1883–84, pp 965, 966
Soda, carbonate of, statistics of........MR 1882, pp 601–602
Soda lakes near Ragtown, Nevada........Mon xi, pp 73–80
Soda, natural, its occurrence and utilization........Bull 60, pp 27–101
Soda, nitrate of, statistics of........MR 1882, pp 599–600
Soda, sulphate of, statistics of........MR 1882, pp 603–604
Sodalite from Litchfield, Maine, description and analysis of........Bull 42, pp 30–31
Sodium and potassium, a method for the separation of, from lithium by the action of amyl alcohol on the chlorides; with some reference to a similar separation of the same from magnesium and calcium........Bull 42, pp 73–88
Sodium salts, statistics of........MR 1887, pp 651–658
Soil and man, action and reaction of the........Ann 12, i, pp 329–345
Soil formation, processes of........Ann 12, i, pp 230–250
Soil movement........Ann 12, i, pp 260–300
Soil, red, from Bermuda, and the coral from which it was derived, analyses of........Bull 52, p 29
Soils and clays from various localities, analyses of........Bull 64, p 51
Soils, effect of animals and plants on........Ann 12, i, pp 268–287
Soils, effects of, on health........Ann 12, i, pp 340–344
Soils, maritime, from Massachusetts, analyses of........Bull 27, pp 68–69
Soils, nature and origin of........Ann 12, i, pp 213–345
Solfataric action at Sulphur bank, California........Mon xiii, pp 253, 258–259
Solfataric action in the Comstock lode and the Washoe district, Nevada....Ann 2, p 313; Mon iii, pp 21, 206, 238, 240, 389
Solfataric action in the Eureka district, Nevada, cause of........Mon vii, pp 89, 188
Solfataric action in the Leadville district, Colorado........Mon xii, p 563
Solfataric emanations at Steamboat springs, Nevada........Mon xiii, pp 342–343
Solfataric gases at Knoxville, California........Mon xiii, pp 287–288
Solid and liquid, the continuity of........Bull 96, pp 71–97
Solid viscosity, the mechanism of........Bull 94
Solids, chemical action between........Bull 64, pp 34–37
Solids, the flow of, or the behavior of solids under high pressure...Bull 55, pp 67–75; Bull 64, pp 38–39

Solids, the viscocity of........Bull 73
Solution as affecting topography........Bull 84, pp 88-89
Solutions, molten magmas considered as........Bull 66, pp 26-29
South America, Cambrian rocks of........Bull 81, p 379
South America, copper preduction of........MR 1883-84, p 356; MR 1885, p 229; MR 1886, p 128; MR 1887, p 88; MR 1888, p 73; MR 1889-90, p 73; MR 1891, p 101
South America, fossil plants of, literature of the........Ann 8, II, pp 820-823
South America, geological maps of, list of the........Bull 7, pp 150-157
South America, lead production of........MR 1883-84, p 434; MR 1885, p 264
South America, quicksilver deposits of........Mon XIII, pp 19-24
South America, tin production of........MR 1883-84, p 625
South America. See, also, each country thereof.
South Carolina, altitudes in........Bull 5, pp 276-278; Bull 76
South Carolina, boundary lines of, and cession of territory to general government........Bull 13, pp 26, 96-97
South Carolina, brick industry of........MR 1888, p 563
South Carolina, building stone from, statistics of........MR 1889-90, pp 373, 428; MR 1891, pp 464, 467
South Carolina; Charleston earthquake of August 31, 1886........Ann 9, pp 203-528
South Carolina, clay deposits of........MR 1891, p 506
South Carolina, Cretaceous deposits of........Bull 82, p 92
South Carolina, Eocene deposits of........Bull 83, pp 50-54, 81, 87
South Carolina, fossils from........Ann 4, pp 309, 310, 311, 312, 314, 315
South Carolina, geologic and paleontologic investigations in........Ann 7, p 121; Ann 8, I, pp 168-169; Ann 10, I, p 155; Ann 11, I, p 69; Ann 12, I, pp 75, 76, 82
South Carolina, geologic maps of, listed........Bull 7, pp 102, 104, 105, 106, 107
South Carolina, gold from, statistics of........Ann 2, p 385; MR 1882, pp 172, 176, 177, 178; MR 1883-84, pp 312, 313; MR 1885, p 201; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889-90, p 49; MR 1891, pp 75, 77
South Carolina; kaolin from Aiken, analysis of........Bull 27, p 63
South Carolina, limestone production of........MR 1891, pp 464, 467
South Carolina, manganese ore in........MR 1886, p 193; MR 1888, pp 124, 130; MR 1889-90, pp 127, 134; MR 1891, p 136
South Carolina, mineral springs of........Bull 32, pp 79-80; MR 1883-84, p 984; MR 1885, p 540; MR 1886, p 718; MR 1887, p 685; MR 1888, p 628; MR 1889-90, pp 522, 532; MR 1891, p 607
South Carolina, minerals of, the useful....MR 1882, pp 728-729; MR 1887, pp 786-788
South Carolina, Neocene beds of........Bull 84, pp 74-81
South Carolina, phosphate deposits of........Bull 46, pp 60-70; MR 1882, pp 504-521; MR 1883-84, pp 783-788; MR 1885, pp 445-449; MR 1886, pp 607-610; MR 1887, pp 580-584; MR 1888, pp 586-590; MR 1889-90, pp 449-451; MR 1891, pp 557-562
South Carolina, topographic work in........Ann 7, p 52; Ann 8, I, p 102; Ann 10, I, p 92; Ann 12, I, p 27
South Dakota. See Dakotas.
Southern complex of the Penokee dist., lake Superior..Mon XIX, pp 103-126, 441-454
Spain, antimony production of........MR 1883-84, p 645
Spain, coal area and output of, compared with those of other countries....MR 1882, p 5; MR 1883-84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1891, p 73
Spain, copper production of........MR 1882, pp 253-254; MR 1883-84, pp 356, 364-367; MR 1885, pp 228, 234-237; MR 1886, pp 128, 133-135; MR 1887, pp 87, 93-95; MR 1888, p 73; MR 1889-90, p 73; MR 1891, pp 100, 102
Spain, fauna of the Olenellus zone from........Ann 10, I, p 580
Spain, fossil plants of, literature of the........Ann 8, II, pp 702-705

Spain, iron and steel production of, compared with that of other countries......MR 1882, p 109; MR 1883–84, p 257; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889–90, pp 21, 22; MR 1891, pp 46, 73
Spain, lead production of..MR 1882, p 322; MR 1883–84, pp 434, 436; MR 1885, pp 264–267
Spain; iron-ore product of Bilboa district, compared with that of Michigan.....MR 1891, pp 18, 38
Spain, manganese production of....................................MR 1886, p 201; MR 1887, pp 159–160; MR 1889–90, p 130
Spain, mining law of..MR 1883–84, p 1000
Spain, phosphate deposits of..................................Bull 46, pp 45, 53–59
Spain, pyrites production of.............................MR 1883–84, pp 882–884; MR 1885, pp 507–508; MR 1886, pp 654–656
Spain, quicksilver mines of.........Ann 8, II, pp 965, 966; Mon XIII, pp 4, 7, 14, 27–32
Spain, quicksilver production of...........MR 1882, pp 392, 393; MR 1883–84, p 496; MR 1885, pp 290–292; MR 1887, p 125; MR 1888, pp 105, 106; MR 1891, pp 123, 124
Spain, silver production of, compared with that of other countries.....MR 1883–84, pp 319, 320
Spain, tin production of.......................................MR 1883–84, p 618
Spain, zinc production of..........................MR 1882, p 358; MR 1883–84, pp 480, 489–490; MR 1885, p 277; MR 1886, p 159; MR 1887, p 117; MR 1888, p 95; MR 1891, pp 113, 114
Specific gravity of lampblack..................................Bull 42, pp 132–135
Speiss, analyses and assays of..................................Mon XII, pp 720, 721
Spencer (J. W.), elevations in the Dominion of Canada..........................Bull 6
Spessartite from Amelia county, Virginia, description and analysis of..Bull 60, p 129
Spessartite garnet from Llano county, Texas, description and analysis of....Bull 90, pp 39–40
Spheroidal parting in greenstones..........................Bull 62, pp 166–168, 177
Spherulites of Obsidian cliff, Yellowstone national park..Ann 7, pp 262–264, 276–278
Spherulites, relation of granophyre groups to...................Ann 7, pp 274–276
Spiegeleisen, production of..MR 1891, p 56
Spiegel iron, analyses of.............................MR 1883–84, pp 561–562, 565
Spongiæ from the Cambrian of the Eureka district, Nevada ....Mon VIII, pp 11–12
Spongiæ from the Devonian of the Eureka district, Nevada ....Mon VIII, p 99
Spongiæ from the middle Cambrian of North America, description of species of..Bull 30, pp 72–91
Spongiæ of the Olenellus zone...............................Ann 10, I, pp 597–599
Spring section, ideal...Ann 3, p 219
Spring water, general chemistry of............................Mon XI, pp 175–178
Spring waters from Maine, Arkansas, and New Mexico, analyses of..Bull 55, pp 91–93
Spring waters of New Zealand, analyses of...............................Ann 9, p 673
Springs, classes of, and those in the Lahontan basin................Mon XI, pp 47–55
Springs, extinct, in Lahontan basin......................................Mon XI, p 51
Springs, hot, travertine and siliceous sinter of.....................Ann 9, pp 613–676
Springs, mineral, of the United States, lists and analyses of the ....Bull 32
Springs of the Kaibab plateau...................................Mon II, pp 129–130
Springs of Mono lake, California ....Ann 8, I, pp 287–292
Springs of Steamboat springs district, Nevada....................Mon XIII, pp 338–340
Sproull (H. S.), gypsum, statistics of ....MR 1885, pp 458–464
Sproull (H. S.), structural materials, statistics of ....MR 1885, pp 395–427
Stahl (E.) and Huntley (D. B.), list of ores, minerals, and mineral substances of industrial importance in Arizona.......................MR 1882, pp 760–764
States surveyed by their coöperation:
  Connecticut...Ann 10, I, pp 7, 88
  Massachusetts.....................................Ann 5, p xviii; Ann 6, p 4

States surveyed by their coöperation—continued.
New Jersey .... Ann 6, pp 5–7
Rhode Island .... Ann 9, p 51; Ann 10, I, pp 7, 85–86
Statistics of the mineral production of the United States .... Ann 2, pp xxvii–xxx, xxxv–xxxvii, 331–401; Ann 4, pp 63–68; Ann 6, pp 88–92; Ann 7, pp 38–39, 131–134; Ann 8, I, pp 85–87, 195–200; Ann 9, pp 27–28, 134–140; Ann 10, I, pp 52–53, 182–188; MR 1882; MR 1883–84; MR 1885; MR 1886; MR 1887; MR 1888; MR 1889–90; MR 1891
Steamboat springs, Nevada, scorodite from .... Bull 61, p 30
Steamboat springs district, Nevada, springs of .... Mon XIII, pp 338–340
Steel, analyses of .... Bull 55, p 88
Steel, carburation of, the effect of mechanical strain on .... Bull 94, pp 40–47
Steel industry of the United States .... Bull 25
Steel, oxide films on, relation between time of exposure, temper-value, and color in .... Bull 27, pp 51–61
Steel, physical definition of .... Bull 14, p 173
Steel, solution of, the effect of strain on the rate of .... Bull 94, pp 48–62
Steel, temper of, relation between electrical resistance and density when varying with the .... Bull 27, pp 30–50
Steel, tempered, the internal structure of .... Bull 35, pp 11–50
Steel, the galvanic, thermo-electric, and magnetic properties of, etc .... Bull 14
Steel, the viscosity of, and its relations to temper and to temperature .. Bull 73, pp 1–73
Steel and glass, the effect of sudden cooling exhibited by .... Bull 42, pp 98–131
Steel and iron from Krupp shell and Gruson armor plate, analyses of .... Bull 55, pp 87–88
Steel and iron in the United States, the manufacture of ...... MR 1883–84, pp 246–257
Steel and iron in the United States, twenty-one years of progress in the manufacture of .... MR 1885, pp 180–195
Steel and iron in the United States, twenty years of progress in the manufacture of .... MR 1891, pp 47–73
Steel and iron industries of the United States in 1887 and 1888 .... MR 1887, pp 10–27
Steel and iron industries of the United States in 1888 and 1889 .... MR 1888, pp 12–32
Steel and iron industries of the U. S. in 1889, 1890, and 1891 ... MR 1889–90, pp 10–22
Steel and iron rails, miles of, in use each year since 1880 .... MR 1891, p 64
Steel. See, also, Iron.
Steep rock series of rocks in Ontario .... Bull 86, pp 70–72
Sternberg (Kaspar Maria, Graf von), biographical sketch of .... Ann 5, p 371
Stevenson (James), death and biographic sketch of .... Ann 9, pp 42–44
Stilbite from Table mountain, Colo., description, analysis, etc., of .. Bull 20, pp 19–23
Stokes (H. N.), a petroleum from Cuba .... Bull 78, pp 98–104
Stokes (H. N.), a supposed mineral resin from Livingston, Mont .. Bull 78, pp 105–108
Stokes (H. N.), on the action of phosphorus oxychloride on the ethers and chlorhydrines of silicic acid .... Bull 90, pp 47–55
Stone, building, statistics of .... MR 1882, pp 450–457; MR 1883–84, pp 662–667; MR 1885, pp 396–404; MR 1886, pp 536–556; MR 1887, pp 511–527; MR 1888, pp 521–547; MR 1889–90, pp 373–440; MR 1891, pp 456–473
Stones, precious, statistics of .... MR 1882, pp 482–503; MR 1883–84, pp 723–782; MR 1885, pp 437–444; MR 1886, pp 595–605; MR 1887, pp 555–579; MR 1888, pp 580–585; MR 1889–90, pp 445–448; MR 1891, pp 539–551
Stowell (S. H.), petroleum, statistics of .... MR 1882, pp 186–211; MR 1883–84, pp 214–232; MR 1885, pp 130–154
Strains, tensile, drawn, and other, in their bearing on Maxwell's theory of viscosity .... Bull 94, pp 17–29
Stratic geology or stratigraphy, principles of .... Ann 11, I, pp 273–275
Stratigraphy of California, notes on the .... Bull 19

Stratigraphy of Cretaceous and Tertiary formations of New Jersey..Mon IX, pp ix-xii
Stratigraphy of the bituminous coal field of Penn., Ohio, and W. Va.....Bull 65
Stratigraphy of the Coast ranges..........Bull 84, pp 200-217
Stratigraphy of the driftless area of the upper Mississippi valley..Ann 6, pp 219-220
Stratigraphy of the lake Superior region..........Bull 86, pp 173-174
Stratigraphy of the Plateau country..........Ann 6, pp 131-140
Stratigraphy and lithology of the Newark system..........Bull 85, pp 32-44
Stratigraphy. See, also, Pleistocene; Neocene; Eocene; Cretaceous; Juratrias; Carboniferous; Devonian; Silurian; Cambrian; Algonkian; Archean.
Stream measurements in western U. S......Ann 11, II, pp 2-22; Ann 12, II, pp 235-345
Stream work in relation to soils..........Ann 12, I, pp 288-293
Streams, migration of..........Ann 12, I, pp 303-304
Streams, terraces of construction and destruction formed by....Ann 11, I, pp 256-273
Striæ of the great ice invasions..........Ann 7, pp 155-248
Striæ, the glacial, of eastern United States, map of the..........Ann 7, pp 154-155
Striation, cross-, and changes of glacier movement..........Ann 7, pp 200-207
Strike, hade, throw, etc., defined..........Ann 4, p 442
Strikes in coal mines..........MR 1891, pp 184, 185, 219-220, 262
Stromeyerite from California..........Bull 61, p 27
Strontia, statistics of..........MR 1882, p 582
Strontium, statistics of..........MR 1886, pp 699-700
Strouhal (V.) and Barus (C.), electrical and magnetic properties of the iron-carburets..........Bull 14
Strouhal (V.) and Barus (C.), physical properties of the iron-carburets......Bull 35
Strouhal (V.) and Barus (C.), relation between electrical resistance and density when varying with the temper of steel..........Bull 27, pp 30-50
Strouhal (V.) and Barus (C.), relation between time of exposure, temper-value, and color in oxide films on steel..........Bull 27, pp 51-61
Strouhal (V.) and Barus (C.), the effect of sudden cooling exhibited by glass and by steel..........Bull 42, pp 98-131
Structure of the Mosquito range, Colorado.......Mon XII, pp 34-39, 202-263, 284-291
Structure of mountains, especially of the Rocky mountains.......Mon XII, pp 24-27
Structure of the Potomac formation..........Mon XV, pp 47-53
Structure of the Sierra nevada..........Bull 33, pp 12-16, 21
Structure of the Trias in Connecticut and New Jersey..........Mon XIV, pp 5-8
Structure. See, also, Diastrophism; Fault; Unconformity.
Stubbs (W. C.), phosphate rock in Alabama..........MR 1883-84, pp 794-803
Subaërial decay of rocks and origin of the red color of certain formations....Bull 52
Subsidence of fine solid particles in liquids..........Bull 36; Bull 60, pp 139-145
Subsidence of mount Desert, Maine, during and after the Glacial period, evidences of..........Ann 8, II, pp 1009-1034
Subsidence of Nantucket island..........Bull 53, pp 28-30, 48
Subsidence and elevation in cape Ann district, Massachusetts, evidences of recent..........Ann 9, pp 567-574
Subsidence and elevation inferred from Cenozoic and Mezozoic rocks of Alabama..........Bull 43, pp 136-138
Subsidence and elevation. See Diastrophism.
Substitution theory of formation of quicksilver ores..........Mon XIII, pp 394-401
Sulphantimonites from Colorado, analyses of..........Bull 60, pp 116, 117
Sulphate of lime as an impurity of brines..........Ann 7, pp 500-504
Sulphate of soda, analyses of..........MR 1882, pp 603, 604
Sulphates, basic ferric..........Mon XII, pp 549-550
Sulphur, deposition of, at Sulphur bank, California..........Mon XIII, p 254
Sulphur, foreign, statistics of..........MR 1882, pp 378-379; MR 1883-84, p 868
Sulphur in steel..........Bull 25, p 13

Sulphur, statistics of .... MR 1882, pp 578–579; MR 1883–84, pp 864–876; MR 1885, pp 494–500; MR 1886, pp 644–647; MR 1887, pp 604–610; MR 1888, pp 5, 10–11; MR 1889–90, pp 515–517; MR 1891, pp 564–571
Sumatra, fossil plants of, literature of the .... Ann 8, ii, p 805
Sun river basin, Montana, hydrography of .... Ann 11, ii, pp 43–94
Sun river basin, Montana, surveys in .... Ann 11, ii, pp 120–133
Superior, lake. See Lake Superior.
Superior (lake) basin, geological maps of the .... Ann 3, pp 92–93, 172–173
Superior, lake, copper-bearing rocks of .... Ann 1, pp 70–71; Ann 2, pp xxxi–xxxiv; Ann 3, pp 89–188; Mon v
Superior, lake, fluctuations of, from 1870 to 1888 .... Bull 72, p 18
Superior, lake, sandstone .... Bull 86, pp 157–160
Superior, lake, synclinal .... Mon v, pp 410–418
Superior, lake. See, also, Michigan; Minnesota; Wisconsin.
Survey, the United States Geological, laws establishing and extending the ... Ann 1, pp 3–4; Ann 4, p xiii
Survey, the United States Geological, laws governing the printing and distribution of the publications of the. See pp 11–14 of this bulletin.
Survey, the United States Geological, the plan and organization of the .... Ann 1, pp 6–14; Ann 7, pp 3–17; Ann 8, i, pp 3–69
Surveys of states by their coöperation:
  Connecticut .... Ann 10, pp 7, 88
  Massachusetts .... Ann 5, p xviii; Ann 6, p 4
  New Jersey .... Ann 6, pp 5–7
  Rhode Island .... Ann 9, p 51; Ann 10, i, pp 7, 85–86
Swamp reclamation in India .... Ann 12, ii, p 561
Swamp soil, fertility of, after drainage and removal of peat .... Ann 10, i, pp 308–310
Swamp soils, character of .... Ann 12, i, pp 311–317
Swamps; catalogue of the larger salt marshes of New England and Long island .... Ann 6, pp 390–398
Swamps, classification of .... Ann 10, i, pp 261–285
Swamps; economic uses of morasses .... Ann 10, i, pp 303–310
Swamps; effect of certain plants on formation of morasses ..... Ann 10, i, pp 285–295
Swamps; fresh-water morasses of the United States, with description of the Dismal swamp .... Ann 10, i, pp 255–339
Swamps, marine, economic problems connected with .... Ann 6, pp 374–380
Swamps; process of development of salt-water marshes .... Ann 6, pp 363–373
Swamps, sea-coast, of eastern United States .... Ann 6, pp 353–398
Swamps, sea-shore, the formation of .... Ann 6, pp 359–361
Swamps which owe their origin to glacial action .... Ann 10, i, pp 295–303
Swank (J. M.), iron ore and its products .... MR 1882, pp 108–144
Swank (J. M.), iron ores in the United States .... MR 1883–84, pp 257–281
Swank (J. M.), the American iron industry from the beginning in 1619 to 1886 .... MR 1886, pp 23–38
Swank (J. M.), the American iron trade in 1886 .... MR 1886, pp 11–22
Swank (J. M.), the iron and steel industries of the United States in 1887 and 1888 .... MR 1887, pp 10–27
Swank (J. M.), the iron and steel industries of the United States in 1888 and 1889 .... MR 1888, pp 12–32
Swank (J. M.), the iron and steel industries of the United States in 1889, 1890, and 1891, compared with those of other countries .... MR 1889–90, pp 10–22
Swank (J. M.), the manufacture of iron and steel in the United States .... MR 1883–84, pp 246–257
Swank (J. M.), twenty-one years of progress in the manufacture of iron and steel in the United States .... MR 1883, pp 180–195

Swank (J. M.), twenty years of progress in the manufacture of iron and steel in the United States .... MR 1891, pp 47-73

Sweden, coal output of, compared with that of other countries .... MR 1882, p 5; MR 1883-84, p 13; MR 1885, p 11; MR 1886, p 235; MR 1887, p 189; MR 1888, p 208; MR 1889-90, p 22; MR 1891, p 73

Sweden, copper production of .... MR 1883-84, p 356; MR 1885, p 228; MR 1886, p 128; MR 1887, p 87; MR 1888, p 73; MR 1889-90, p 73; MR 1891, p 100

Sweden, fauna of the Olenellus zone in .... Ann 10, I, pp 577-578

Sweden, fossil plants of, literature of the .... Ann 8, II, pp 779-781

Sweden, gold and silver production of, compared with that of other countries .... MR 1883-84, pp 319, 320

Sweden, iron and steel production of, compared with that of other countries .... MR 1882, p 109; MR 1883-84, p 257; MR 1885, p 193; MR 1886, p 21; MR 1887, p 18; MR 1888, pp 28, 29, 30, 31; MR 1889-90, pp 21, 22; MR 1891, p 73

Sweden, lead production of .... MR 1883-84, p 434; MR 1885, p 264

Sweden, manganese production of .... MR 1889-90, p 130

Sweden, nickel production of .... MR 1882, pp 405-406

Sweden, tin production of .... MR 1883-84, p 619

Sweetwater and adjacent mountains, literature of the geology of .. Bull 86, pp 278-279

Switzerland, fossil plants of, literature of the .... Ann 8, II, pp 738-744

Syenite, augite, of the Keweenaw series .... Mon V, pp 112-124

Syenites, Arkansas, results of tests of .... MR 1889-90, p 379

Synclinal of the lake Superior basin .... Ann 3, pp 174-179; Mon V, pp 410-418

Table mountain, Golden, Colorado, minerals from the basalt of ..... Bull 20, pp 13-39

Tables and formulas to facilitate the construction and use of maps .... Bull 50

Taconian terrane defined .... Bull 86, pp 464-466

Taconic, on the use of the name .... Bull 30, pp 65-70

Taconic range, literature of the geology of the .... Bull 86, pp 361, 363, 379, 390, 393

Tahoe lake as a reservoir for irrigation purposes .... Ann 11, II, pp 169-172

Tahoe lake, water of, analysis of the .... Mon XI, p 42

Talc, statistics of .... MR 1882, p 585; MR 1885, pp 534-535; MR 1889-90, p 476; MR 1891, p 594

Talus, process of formation of .... Ann 12, I, pp 232-236

Tampa group of rocks of Florida .... Bull 84, pp 112-123

Tantalite from the Etta tin mine, Dakota, analysis of .... MR 1888, p 151

Taos district of the Rio Grande, hydrography and irrigation in the .... Ann 12, II, pp 251-256

Tariff of March 3, 1883, certain schedules from the .... MR 1882, pp 777-787

Tasmania, fossil plants of, literature of the .... Ann 8, II, pp 814-815

Taxonomy of the lower part of the geological column .... Ann 7, pp 448-454

Taxonomy and correlation .... Bull 82, pp 17-26, 207-247

Taxonomy and nomenclature, geologic, conference of geologists and lithologists on, in January, 1889 .... Ann 10, I, pp 56-67

Taxonomy. See Correlation; Nomenclature.

Taylor (F. W.), cobalt, statistics of .... MR 1882, pp 421-423

Taylor, mount, and the Zuñi plateau .... Ann 6, pp 105-198

Tejon, Chico-, series .... Ann 6, pp 68-70, 73; Bull 15, pp 11-17; Bull 19, pp 14, 17; Bull 83, pp 100-110

Tejon, Chico-, series in Oregon and Washington, equivalents of the .. Bull 51, pp 28-32

Tejon, Chico-, series of California, new fossil Mollusca from the .... Bull 51, pp 11-27

Tejon group, digest of the literature relating to the .... Bull 83, pp 100-110

Tejon. See, also, Cretaceous; Eocene.

Tellurium, statistics of .... MR 1882, p 447; MR 1886, pp 648-649

Temper chemically interpreted .... Bull 14, pp 77-79, 88, 98

Temper and viscosity of steel, relation between .... Bull 73, pp 1–52

Temper, electrical resistance, and viscosity .... Bull 94, pp 31–33

Temper in steel, hydroelectric effect of .... Bull 42, pp 121–129

Temperature and electrical conductivity, relation between .... Bull 14, pp 15–27

Temperature and pressure, dependence of fluid volume on .... Bull 92, pp 17–67

Temperature and strain from sudden cooling, relations between ... Bull 42, pp 98–112

Temperature and viscosity of steel, relation between .... Bull 78, pp 53–73

Temperature coefficient of steel .... Bull 14, pp 15–24

Temperature, constant high, degree of, attained in metallic vapor baths of large dimension .... Bull 54, pp 56–83

Temperature data for color effect in oxidation of iron carburets .... Bull 35, pp 51–57

Temperature, effect of, in production of petroleum and natural gas .... Ann 8, II, pp 493, 495–496

Temperature, effect of, in subsidence of fine solid particles in liquids ...... Bull 36, pp 20–24

Temperature, effect of, on glaciation .... Mon I, pp 276–283

Temperature, effect of, on Molluscan life .... Bull 11, p 38

Temperature gradients, underground, determination of, at the Wheeling deep well (4,471 feet), West Virginia .... Ann 12, I, p 63

Temperature, inequalities of, as cause of errors in barometric hypsometry .... Ann 2, pp 420–425, 536

Temperature, influence and effect of, in annealing of steel .... Bull 14, pp 43–59

Temperature, influence of, on crystallization of igneous magmas .... Bull 66, p 25

Temperature of artesian water .... Ann 5, pp 165–167

Temperature. See, also, Heat; Thermal.

Temperatures, high, of the mines of the Comstock lode, Nevada .... Ann 2, p 312; Mon III, pp 228–265, 387–392; Mon IV, pp 389–400

Temperatures, high, thermo-electric measurement of .... Ann 4, pp 53–59; Ann 10, pp 179–180; Bull 54

Temperatures of lake Tahoe at different depths .... Mon XI, p 72

Tempering of steel and magnetic retention and stability .... Bull 14, pp 151–172

Tempering of steel, the conditions which determine the efficacy of the operation of .... Bull 14, pp 28–75

Tennessee, altitudes in .... Bull 5, pp 279–282; Bull 76

Tennessee; beryl from Greene county, analysis of .... Bull 9, p 11

Tennessee, boundary lines of, and formation of state .... Bull 13, pp 30, 108–109

Tennessee, brick industry of .... MR 1887, pp 536, 539; MR 1888, p 563

Tennessee, building stone from, statistics of .... MR 1882, p 451; MR 1886, pp 543–544; MR 1887, p 518; MR 1888, pp 533, 541, 543; MR 1889–90, pp 373, 429–430; MR 1891, pp 464, 467, 468, 470

Tennessee, Cambrian rocks of, correlation of the .... Bull 81, pp 139–144, 154–155, 299–303, 311, 383

Tennessee, coal area and statistics of .... Ann 2, p xxviii; MR 1882, pp 72–73; MR 1883–84, pp 12, 88; MR 1885, pp 11, 64–67; MR 1886, pp 225, 230, 341–347; MR 1887, pp 169, 171, 352–357; MR 1888, pp 169, 171, 362–366; MR 1889–90, pp 146, 269–271; MR 1891, pp 180, 320–325

Tennessee, coals and cokes from, analyses of .... Bull 64, pp 54–55

Tennessee, coke in, the manufacture of .... MR 1883–84; pp 196–202; MR 1885, pp 80, 111–116; MR 1886, pp 378, 384, 417–421; MR 1887, pp 383, 389, 420; MR 1888, pp 395, 400, 425; MR 1891, pp 360, 361, 366, 395

Tennessee, copper deposits and statistics of .... Ann 2, p xxix; MR 1882, p 231

Tennessee, Eocene deposits of .... Bull 83, pp 70–71, 83

Tennessee, fossils from .... Ann 4, pp 294, 301; Ann 8, II, pp 881–882

Tennessee, geologic and paleontologic investigations in .... Ann 5, pp 52, 53; Ann 6, pp 24, 25; Ann 7, pp 67, 114; Ann 8, I, p 175; Ann 9, p 76; Ann 10, I, pp 120, 157; Ann 11, I, pp 58, 71, 72, 75; Ann 12, I, pp 54, 62, 75, 78, 79

Tennessee, geologic maps of, listed........................Bull 7, pp 102, 103, 104, 107

Tennessee, gold from, statistics of....................Ann 2, p 385; MR 1882, pp 172, 176, 177, 178; MR 1883-84, p 312; MR 1886, p 104; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1891, pp 76, 77

Tennessee, iron and steel from, statistics of................Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883-84, pp 252, 278; MR 1885, pp 182, 184, 186, 188; MR 1886, pp 14, 18, 33, 92-96, 98; MR 1887, pp 11, 16; MR 1888, pp 14, 17, 23; MR 1889-90, pp 10, 17, 24, 40; MR 1891, pp 12, 25, 54, 55, 61

Tennessee, lime production of........................MR 1887, p 533; MR 1888, p 556

Tennessee, limestone production of..........................MR 1891, pp 464, 467

Tennessee, manganese ore in.......................MR 1885, p 344; MR 1886, pp 181, 193-194; MR 1888, pp 124, 131; MR 1889-90, pp 127, 135; MR 1891, p 137

Tennessee, marble industry of..............................MR 1891, pp 468, 470

Tennessee, metallic-paint production of...........................MR 1891, p 597

Tennessee, mineral springs of..........................Bull 32, pp 97-106; MR 1883-84, p 985; MR 1885, p 540; MR 1886, p 718; MR 1887, p 686; MR 1888, p 628; MR 1889-90, p 532; MR 1891, pp 603, 608

Tennessee, minerals of, the useful.........MR 1882, pp 730-733; MR 1887, pp 788-792

Tennessee, petroleum localities and statistics of...............MR 1885, pp 147-148; MR 1889-90, pp 362-363

Tennessee, rocks of, their classification, etc................Bull 80, pp 37, 41, 164-166

Tennessee, topographic work in....................Ann 4, pp 13-15; Ann 5, pp 4-5; Ann 6, pp 8, 9, 10; Ann 7, pp 50, 52; Ann 8, I, p 102; Ann 9, p 55; Ann 10, I, p 89; Ann 12, I, pp 27-28

Tennessee; water from Mountain city, analysis of......................Bull 64, p 58

Tennessee, zinc deposits in..........................Ann 2, p xxix; MR 1882, p 367

Terra rossa of southern Europe, equivalent of, in America..............Bull 52, p 25

Terraces and embankments, the formation of......................Ann 2, pp 171-172; Ann 3, pp 206-208; Mon I, pp 36, 46-58, 78-86; Mon XI, pp 88-99

Terraces, embankments, deltas, etc., of shore topography..........Mon XI, pp 88-99

Terraces of lake Agassiz...Bull 39

Terraces of the glacial flood deposits in the Mississippi valley....Ann 6, pp 308-311

Terraces of the Grand canyon district...............................Ann 2, pp 74-94; Mon II, pp 32, 35-37, 40, 43, 46-47

Terraces of various kinds........................Ann 5, pp 115-120; Mon I, pp 78-86

Terraces, stream-formed, analysis and classification of..........Ann 11, I, pp 256-273

Territorial changes in the United States, historical sketch of the...Bull 13, pp 24-32

Tertiaries of Colorado and Utah, some insects of special interest from the...Bull 93

Tertiary bitumen deposits..Ann 11, I, pp 596-597

Tertiary formations in southwestern Kansas.......................Bull 57, pp 31-38

Tertiary history of the Grand canyon district.....Ann 2, pp xii-xvi, 47-166; Mon II

Tertiary of western America, divisions and fauna of the......................Ann 5, pp 252-254; Mon X, pp 5-8

Tertiary Ostreidæ, North American...................................Ann 4, pp 309-316

Tertiary rocks in California.......................................Bull 15, pp 15-16, 32; Bull 19, pp 10, 13, 17; Bull 51, pp 11-14; Mon XIII, pp 214-221, 461

Tertiary rocks in the Lassen peak district, California..........Ann 8, II, pp 413-424

Tertiary rocks of Martha's vineyard..............................Ann 7, pp 326-347

Tertiary rocks of Texas...Bull 45, pp 84-86

Tertiary strata in the region of the Uinta mountains............Ann 9, pp 690-691

Tertiary and Cretaceous formations of New Jersey, sketch of the geology of the..Mon IX, pp ix-xiii

Tertiary and Cretacious strata of the Tuscaloosa, Tombigbee, and Alabama rivers..Bull 43

Tertiary and Mesozoic paleontology of California..........................Bull 15

Tertiary and post-Tertiary volcanic rocks of Eureka dist., Nev....Ann 3, pp 277–287
Tertiary. See, also, Eocene; Neocene.
Teton range, Archean and Algonkian literature of the ....Bull 86, p 281
Tewan mountains, New Mexico, a group of volcanic rocks from the, and the occurrence of primary quartz in certain basalts...........................Bull 66
Texan formations, diagram showing interrelation of....................Bull 82, p 127
Texan Permian and its Mesozoic types of fossils...................................Bull 77
Texan system of rocks ....Bull 86, pp 267–269
Texas, boundary lines of, and admission of Republic of........Bull 13, pp 21, 105–106
Texas, altitudes in..Bull 5, pp 283–289; Bull 76
Texas, artesian wells of, list of the..Ann 11, II, p 272
Texas, brick industry of....................MR 1887, pp 536, 539; MR 1888, pp 563, 566
Texas, building-stone production of................MR 1891, pp 457, 461, 463, 464, 467
Texas, Cambrian rocks of, correlation of the..Bull 81, pp 216–219, 234–235, 354–356, 385
Texas, Chamidæ from the Cretaceous rocks of, aberrant forms of ......Bull 4, pp 5–9
Texas, clay production of..MR 1891, pp 518–522
Texas, coal area and statistics of...MR 1882, p 74; MR 1883–84, pp 12, 89; MR 1885, pp 11, 67–68; MR 1886, pp 225, 230, 347–350; MR 1887, pp 169, 357–359; MR 1888, pp 169, 171, 367–374; MR 1889–90, pp 147, 271; MR 1891, pp 180, 325–328
Texas, copper deposits of....................................MR 1883–84, pp 342–343
Texas, Cretaceous rocks of............................Bull 82, pp 114–130, 220–223
Texas, Eocene deposits in..Bull 83, pp 76–79, 84
Texas; fixation of the 105th meridian in El Paso county ....Bull 70, pp 71–79
Texas, fossils from..........................Ann 4, pp 292–307; Ann 8, II, pp 897–898
Texas, gadolinite from Llano county, analysis of..........................Bull 64, p 40
Texas, geologic and paleontologic investigations in................Ann 6, pp 75–76; Ann 8, I, pp 179–180; Ann 9, pp 120–121; Ann 10, I, pp 163–164; Ann 11, I, pp 58, 107; Ann 12, I, p 114
Texas, geologic maps of, listed..................................Bull 7, pp 139, 140, 141
Texas, geology of, present condition of knowledge of the........................Bull 45
Texas, gold and silver from, statistics of ....MR 1889–90, p 49; MR 1891, p 77
Texas, gypsum industry in...MR 1891, p 582
Texas, iron and steel from, statistics of......MR 1882, pp 120, 129, 131; MR 1883–84, p 252; MR 1885, pp 182, 184; MR 1886, pp 18, 33; MR 1887, pp 11, 51–52; MR 1888, pp 14, 23; MR 1889–90, pp 10, 17, 24, 40; MR 1891, pp 12, 27, 54, 55
Texas; iron regions of northern Louisiana and eastern Texas, a report on the, by Lawrence C. Johnson. See p 323 of this bulletin.
Texas; latitudes and longitudes of Cisco and Sierra Blanca determined .....Ann 11, I, p 129; Bull 70
Texas, lignite beds of..MR 1891, pp 327–328
Texas, lime production of..........................MR 1887, p 533; MR 1888, p 556
Texas; limestone from El Paso county, analysis of................MR 1889–90, p 432
Texas; lithographic stone in Blanco county ....MR 1889–90, p 519
Texas, meteoric iron from, description and analysis of...................Bull 78, p 95
Texas, meteorite, stony, from, description and analysis of ....Bull 78, pp 91–93
Texas, mineral springs of...Bull 32, pp 124–128; MR 1883–84, p 985; MR 1885, p 540; MR 1886, p 718; MR 1887, p 686; MR 1888, p 628; MR 1889–90, p 532; MR 1891, pp 603, 608
Texas, minerals of, the useful............MR 1882, pp 733–736; MR 1887, pp 792–794
Texas, Neocene beds of ....Bull 84, pp 172–177
Texas, petroleum from, statistics of ....MR 1889–90, pp 292, 359–361
Texas, salt from, statistics of................MR 1882, pp 532–534; MR 1883–84, p 842
Texas; spessartite garnet from Llano county, description and analysis of.......Bull 90, pp 39–40

Texas, topographic work in..........Ann 6, pp 12–13; Ann 7, p 55; Ann 8, I, p 104; Ann 9, pp 57–58; Ann 10, I, pp 95–96; Ann 11, I, p 40; Ann 12, I, pp 30, 47

Thermal effect of the action of aqueous vapor on feldspathic rocks..........Ann 2, pp 325–330; Mon III, pp 290–306, 397–400

Thermal expansion, literature and measurement of..........Bull 92, pp 17–18, 27

Thermal expansion of certain rocks, preliminary note on the coefficients of.....Bull 78, pp 109–118

Thermal springs and Molluscan life..........Bull 11, p 40

Thermal survey of the Comstock lode, Nevada..........Mon III, pp 244–265

Thermal. See, also, Heat; Temperature.

Thermodynamics of liquids, the volume..........Bull 96

Thermo-electric data of alloys..........Bull 14, pp 80–88

Thermo-electric effect of magnetization..........Bull 14, pp 104–110

Thermo-electric, galvanic, and magnetic properties of wrought iron, steel, and cast iron in different states of hardness..........Bull 14

Thermo-electric measurement of high temperatures..........Ann 4, pp 53–59; Bull 54

Thermo-electric power and specific resistance of steel, relation between....Bull 14, pp 62–70

Thermo-electric power, measurement of..........Bull 14, pp 31–36

Thermo-electric properties, specific resistance, and hardness of steel, relation of..........Bull 14, pp 203–226

Thinolite, chemical nature of..........Bull 12, pp 22–25

Thinolite, crystallographic study of..........Bull 12, p 14; Mon XI, pp 194–201

Thinolite in the Mono basin, Cal..........Ann 8, I, pp 315–317, 320; Bull 12, pp 19–20

Thinolite of lake Lahontan, crystallographic study of the..........Ann 8, I, pp 315–318; Mon XI, pp 194–200; Bull 12

Thinolite of Walker lake, Nevada..........Bull 12, p 20

Thinolite, original crystalline form of..........Bull 12, pp 20–22

Thinolite, relation of, to gaylussite pseudomorphs..........Bull 12, pp 25–28

Thinolitic tufa of the lake Lahontan basin, Nevada..........Mon XI, pp 192–201

Thomsenolite from near Pike's peak, Colorado, occurrence and description of...Bull 20, pp 55–56

Thompson (A. H.), report on topographic branch of irrigation survey for 1888–89..........Ann 10, II, pp 65–77

Thompson (A. H.), report on topographic branch of irrigation survey for 1889–90..........Ann 11, II, pp 291–343

Thompson (A. H.), report on topographic work during 1890–91..Ann 12, I, pp 42–52

Thompson (A. H.), report on the location and survey of reservoir sites during the fiscal year ending June 30, 1891..........Ann 12, II, pp 1–212

Thompson (G.), administrative report for 1881–82..........Ann 3, pp 32–41

Thompson (G.), quoted on glaciers of mount Shasta..........Ann 5, pp 332–334

Thomsonite from Table mountain, Colorado, general description and chemical composition of..........Bull 20, pp 24–27

Thomsonite spherules from Table mountain, Colorado, chemical identification of..........Bull 20, pp 18–19

Thorium and uranous sulphates, on the isomorphism and composition of.......Bull 90, pp 26–33

Thymol, compressibility and thermal expansion of..........Bull 92, pp 37–38

Tile, brick, etc., statistics of..........MR 1882, pp 457–458; MR 1883–84, pp 679–711; MR 1885, pp 415–427; MR 1886, pp 566–580; MR 1887, pp 534–551; MR 1888, pp 557–575

Till, summary of facts concerning the unstratified deposit called...Bull 58, pp 42–75

Till. See, also, Glacial; Glacier.

Timbering in the Comstock mines, Nevada..........Mon III, pp 5–6

Timbering in the Eureka mines, Nevada..........Mon VII, pp 153–157

Time ratios of the Coastal plain .... Ann 12, I, pp 428–429

Tin, analyses of .... MR 1883–84, pp 626, 629

Tin, foreign sources of .... MR 1882, p 436; MR 1883–84, pp 615–625; MR 1885, pp 376–383; MR 1889–90, p 121

Tin, physical properties of .... MR 1883–84, pp 625–629

Tin, statistics of .... MR 1882, pp 434–437; MR 1883–84, pp 592–640; MR 1885, pp 370–385; MR 1886, pp 214–217; MR 1887, pp 134–137; MR 1888, pp 144–159; MR 1889–90 pp 119–123; MR 1891, pp 164–166

Tin ore, analyses of .... MR 1882, p 434; MR 1883–84, p 614; MR 1885, p 370; MR 1888, pp 151–154

Tin ore, assays of .... MR 1888, pp 146–147

Tin-plate industry .... MR 1883–84, pp 633–637; MR 1888, pp 20–22

Tin-plate industry, efforts to establish the .... MR 1891, p 69

Titanium and aluminum, separation of, and of titanium and iron .. Bull 27, pp 16–26

Titanium, separation of, in rock analyses .... Bull 78, pp 87–90

Tombigbee, Tuscaloosa, and Alabama rivers, Tertiary and Cretaceous strata of the .... Bull 43

Topaz, an unusual occurrence of .... Bull 20, pp 81–82

Topaz at Devil's head mountain, Colorado, notes upon the occurrence of.... Bull 20, pp 73–74

Topaz from Florissant and Devil's head mountain, Colorado .... Bull 20, pp 70–73

Topaz from Stoneham, Maine .... Bull 27, pp 9–15

Topaz in nevadite from Chalk mountain, Colorado .... Mon XII, p 347

Topaz in rhyolite .... Bull 20, p 81

Topographic features of the Penokee district in relation to geology .... Mon XIX, pp 145, 188–189, 301–302

Topographic forms, classification of, by hydrography .... Ann 7, pp 558–564

Topographic map of the United States, plan and description of the .... Ann 4, pp xiii–xxiv; Ann 6, pp xvi–xix; Ann 7, pp 3–8

Topographic map of the United States; altas sheets engraved to May 20, 1893. See pp 307–320 of this bulletin.

Topographic work in the United States done by national and state organizations and by corporate and private enterprise, sketch of..... Ann 4, pp xiv–xx

Topographic work in the various states and territories. See each state and territory.

Topographic work, reports on .... Ann 3, pp xv–xvi; Ann 4, pp xiii–xxiv, 3–16; Ann 5, pp xvii–xx, 3–14; Ann 6, pp xv–xix, 3–17; Ann 7, pp 3–8, 45–60; Ann 8, I, pp 70–74, 97–122; Ann 9, pp 3–7, 49–69; Ann 10, I, pp 5–9, 83–108; Ann 11, I, pp 4–10, 33–48; Ann 12, I, pp 3–8, 23–52

Topography, analysis of .... Ann 7, pp 558–564

Topography and geology, interdependence of .... Mon XII, p 29

Topography and geology of India .... Ann 12, II, pp 399–403

Topography as affected by solution .... Bull 84, pp 88–89

Topography due to faulting .... Ann 4, pp 443–450

Topography. See, also, Physiography.

Toroweap valley and the middle portion of the Grand canyon .... Ann 2, pp 104–121; Mon II, pp 78–100

Tourmaline from Nevada county, California, description and analysis of.. Bull 90, p 39

Tourmaline, the analysis and composition of .... Bull 55, pp 19–37

Tourmaline. See, also, Precious stones.

Trade wind confined within narrow vertical limits .... Ann 4, p 145

Transportation, littoral .... Ann 5, pp 85–90

Transportation. See, also, Degradation.

Trap, decomposed, from near Sanford, North Carolina, analysis of..... Bull 42, p 138

Trap dikes and sheets, characteristics of .... Bull 85, p 69

Trap rocks, decay of ... Bull 52, pp 16–18
Trap rocks, geographical distribution of, in eastern United States .. Bull 85, pp 70–72
Trap rocks of the Newark system ... Bull 85, pp 66–77
Traps as data for correlation of Newark areas ... Bull 85, pp 30–31
Traps of the Newark system in the New Jersey region, the relations of the .. Bull 67
Traps of the Triassic series in Connecticut valley ... Ann 7, pp 462–468
Traps. See, also, Basalt.
Travertines, analyses of ... Ann 9, p 646
Travertine and siliceous sinter, formation of, by hot springs ... Ann 9, pp 613–676
Travertine. See, also, Tufa.
Trees as agents of soil formation ... Ann 12 I, pp 269–274
Trenton limestone as a source of petroleum and inflammable gas in Ohio and Indiana ... Ann 8, II, pp 475–662
Tres piedras mesa, Rio Grande basin, irrigation on ... Ann 12, II, p 256
Trias in southwestern Kansas ... Bull 57, pp 20–27
Trias of the Atlantic slope, flora of the ... Mon XV
Trias of Virginia and North Carolina and flora therefrom ... Mon VI, pp 2, 92–93, 95, 100–101, 125–126
Trias. See, also, Jura-trias.
Triassic age, fossil insects of, found in the Leadville district, Colo ... Mon XII, p 71
Triassic of the Connecticut valley, structure of the ... Ann 7, pp 455–490
Triassic rocks of New Jersey and the Connecticut valley, fossil fishes and plants of the ... Mon XIV
Triassic rocks of New Jersey and the Connecticut valley, geological relations and equivalents of the ... Mon XIV, pp 1–15
Triassic. See, also, Jura-trias.
Trilobita, catalogue of American Paleozoic ... Bull 63, pp 79–148
Trilobita from the Cambrian of the Eureka district, Nevada ... Mon VIII, pp 24–64
Trilobita from the Carboniferous of the Eureka district, Nev ... Mon VIII, pp 266–267
Trilobita from the Devonian of the Eureka district, Nevada ... Mon VIII, pp 207–211
Trilobita from the lower Silurian of the Eureka district, Nevada .. Mon VIII, pp 89–98
Trilobita from the middle Cambrian of North America ... Bull 30, pp 149–222
Trilobita of the Olenellus zone ... Ann 10, I, pp 629–658
Trinidad island, asphaltum production of ... MR 1882, p 605; MR 1883–84, p 937; MR 1891, pp 453–454
Trinidad asphalt pavements, cities where used ... MR 1891, p 454
Triplite from the Black hills, Dakota, analysis of ... Bull 60, pp 135–136
Troilite, typical composition of ... MR 1885, p 517
Truckee group of rocks of Oregon, Idaho, and Nev ... Bull 84, pp, 282, 285–286, 313–315
Truckee reservoir sites and canal line ... Ann 11, II, pp 172, 175, 176
Truckee river basin, hydrography of ... Ann 11, II, pp 63–65, 101, 108; Ann 12, II, pp 324–325
Tscheffkinite and astrophyllite, new analyses of ... Bull 90, pp 41–44
Tufa and sinter of hot springs ... Ann 9, pp 613–676
Tufa, calcareous, of Borax lake, California ... Mon XIII, pp 266–268
Tufa, calcareous, of lake Lahontan ... Mon XI, pp 189–222
Tufa, calcareous, of Mono valley, California, varieties and formation of ... Ann 8, I, pp 297, 310–318
Tufa, calcareous, of Pleistocene lakes of the Great basin ... Mon I, pp 167–169
Tufa, dendritic, of lake Lahontan ... Ann 3, pp 214–215; Mon XI, pp 201–203
Tufa deposits, succession of, in lake Lahontan ... Ann 3, pp 215–221; Mon XI, pp 204–207; Bull 12, pp 10–14
Tufa from Salt lake desert, analysis of ... Mon I, p 168
Tufa in lake Lahontan, conditions favoring the deposition of ... Mon XI, pp 210–222
Tufa in the lake Bonneville basin ... Ann 2, pp 190–191; Mon I, pp 167–169

Tufa, lithoid, of lake Lahontan..............Ann 3, pp 212–213; Mon XI, pp 190–192
Tufa, thinolitic, nature and origin of..............Bull 12, pp 20–28
Tufa, thinolitic, of lake Lahontan..............Ann 3, pp 213–214; Mon XI, pp 192–200
Tufa, thinolitic, of Mono valley, California..............Ann 8, I, pp 315–318
Tufas from lake Lahontan, analyses of..............Ann 3, p 216; Mon XI, pp 53, 203; Bull 12, p 12
Tuff, basaltic, of the Bonneville basin..............Mon I, pp 319–336
Tuff, diabase..............Bull 62, pp 133, 158–162, 175–177
Tuff of acid rocks..............Bull 62, pp 151–154
Tule lands, formation and fertility of..............Ann 12, I, pp 320–321
Tule river, California, hydrography of..............Ann 12, II, pp 319–320
Tungsten, statistics of..............MR 1882, pp 431–433; MR 1883–84, pp 574–575; MR 1885, p 366; MR 1886, pp 218–219
Tuolumne river, California, hydrography of..............Ann 12, II, pp 322–323
Turkestan, fossil plants of, literature of the..............Ann 8, II, pp 796–797
Turkey, gold and silver production of, compared with that of other countries..............MR 1883–84, pp 319, 320
Turkey, lead production of..............MR 1883–84, p 434; MR 1885, p 264
Turkey, manganese production of..MR 1886, p 205; MR 1888, p 142; MR 1889–90, p 130
Turkey, quicksilver deposits in..............Mon XIII, p 42
Turner (G. M.), novaculite, statistics of....MR 1885, pp 433–436; MR 1886, pp 589–594
Turner (G. M.), phosphorus, statistics of..............MR 1886, pp 676–677
Turquoise from New Mexico..............Bull 42, pp 39–44
Turquoise. See, also, Precious stones.
Tuscaloosa and Potomac formations..............Ann 12, I, pp 421–424
Tuscaloosa, Tombigbee, and Alabama rivers, Tertiary and Cretaceous strata of the..............Bull 43
Twin lakes, Colorado, surveyed for reservoir site..............Ann 11, II, pp 135–139
Tyrolite from the Mammoth mine, Tintic district, Utah, analyses of..........Bull 55, pp 41–43; Bull 64, p 40
Uinkaret plateau, Grand canyon district, description of the..............Ann 2, pp 72, 121–126; Mon II, pp 10, 101–121
Uinta fold, the..............Ann 9, pp 692–697
Uinta group of rocks, correlation of the..............Bull 83, pp 196, 143–146
Uinta mountains, Archean and Algonkian literature of the... Bull 86, pp 286–289, 505
Uinta sandstone, the..............Ann 9, pp 687–688; Bull 86, pp 287–289
Unconformities above and below the Potomac formation..............Mon XV, pp 58–59
Unconformities in the Coast ranges of California........Mon XIII, pp 188–195, 295–299
Unconformities in the Penokee district..............Ann 10, I, pp 453–456
Unconformities near Gunnison, Colorado..............Ann 6, pp 64–66
Unconformity as a basis for classification of formations....Ann 7, pp 390–395, 438–445
Unconformity at base of and within the clastic series of the lake Superior region..............Bull 86, pp 174–183
Unconformity at base of Eastern sandstone, lake Superior......Mon XIX, pp 461–463
Unconformity at base of Keweenaw series..............Mon XIX, pp 456–461
Unconformity between Archean and Algonkian in the Penokee district....Mon XIX, pp 444–454
Unconformity between cherty limestone and Penokee series.... Mon XIX, pp 454–455
Unconformity, distinguishing characters of..............Ann 7, pp 395–437
Unconformity of Keweenaw and Huronian rocks..............Mon V, pp 155–156
Unconformity of Keweenaw series and Eastern sandstone........Ann 3, pp 152–155; Mon V, pp 251–259; Bull 23
Unconformity of Silurian rocks at Eureka, Nevada..............Ann 3, p 267
Unconformity seen in the walls of the Grand canyon of the Colorado........Mon II, pp 178–182, 207

Undertow, the function of the, in littoral erosion.... Ann 5, pp 82–83; Mon I, pp 33, 38
Unga conglomerate of Alaska .... Bull 84, pp 234–235
Unger (Franz), biographical sketch of .... Ann 5, p 375
United States. See each state and territory.
United States Geological Survey, laws establishing and extending the; laws governing its publications. Ann 1, pp 3–4; Ann 4, p xiii; this Bull (100), pp. 11–14
United States Geological Survey, plan and organization of the .... Ann 1, pp 6–14; Ann 7, pp 3–17; Ann 8, I, pp 3–69
Upham (W.), altitudes between lake Superior and the Rocky mountains ..... Bull 72
Upham (W.), upper beaches and deltas of the glacial lake Agassiz .... Bull 39
Upheaval. See Diastrophism; Elevation.
Uralitization, cause, nature, etc.. Bull 28, pp 40–43, 49; Bull 59, p 24; Bull 62, pp 52–55
Uraninite, new analyses of .... Bull 90, pp 22–25
Uraninite, the occurrence of nitrogen in, and the composition of uraninite in general .... Bull 78, pp 43–79
Uraninites, North American, preliminary remarks on .... Bull 60, pp 131–133
Uranium, statistics of .... MR 1882, p 448
Uranous sulphates, the isomorphism and composition of thorium and. Bull 90, pp 26–33
Utah, altitudes in .... Bull 5, pp 290–300; Bull 76
Utah, antimony deposits in .... MR 1883–84, pp 643–644; MR 1891, p 174
Utah, asphaltum deposits and industry of .... MR 1888, p 513; MR 1889–90, p 478
Utah, associated rare minerals from .... Bull 20, pp 83–88
Utah, boundary lines of, and formation of territory .... Bull 13, pp 31, 124–125
Utah; Cambrian faunas of North America, studies on the .... Bull 30
Utah, Cambrian rocks of .... Bull 81, pp 156–158, 319–320, 384
Utah, cement industry at Salt lake city .... MR 1891, p 532
Utah, coal area and statistics of....... MR 1882, pp 74–81; MR 1883–84, pp 12, 89–90; MR 1885, pp 11, 68–69; MR 1886, pp 225, 230, 350–352; MR 1887, pp 169, 359–360; MR 1888, pp 169, 171, 374–376; MR 1889–90, pp 147, 272; MR 1891, pp 180, 329–330
Utah coals, analyses and calorific values of some .... MR 1882, pp 76–81
Utah, coke in, the manufacture of .... MR 1883–84, pp 202–204; MR 1885, pp 80, 116–117; MR 1886, pp 378, 384, 422; MR 1887, p 389; MR 1888, p 400; MR 1891, pp 360, 361, 366, 368
Utah, copper minerals from, notes on certain rare .... Bull 55, pp 38–47
Utah, copper from, statistics of ... MR 1882, pp 216, 228–229; MR 1883–84, pp 329, 342; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84
Utah, Cretaceous rocks of.................... Bull 82, pp 148, 154, 156, 162, 164, 234–235
Utah; eruptive rocks from the Henry mountains, analysis of........... Bull 60, p 154
Utah, fossils from .... Ann 3, pp 420–470; Ann 4, pp 293, 299, 300, 304, 313, 314; Ann 8, II, p 918; Bull 34, pp 21–32
Utah, geologic and paleontologic investigations in .... Ann 1, pp 24–25, 37–38; Ann 2, pp 11–13; Ann 3, pp 28–29; Ann 7, pp 115–116, 118
Utah, geologic maps of, listed .... Bull 7, pp 133, 134, 135, 136, 137, 170
Utah; geology and physiography of a portion of northwestern Colorado and adjacent parts of Utah and Wyoming .... Ann 9, pp 677–712
Utah, gold and silver from, statistics of...... Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883–84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 75, 77, 78, 79
Utah; Grand canyon district, physical geology of the .... Ann 2, pp 49–166
Utah; Grand canyon district, Tertiary history of the .... Mon II and atlas
Utah, iron and steel from, statistics of........ MR 1882, pp 120, 129, 131; MR 1883–84, pp 252, 288–289; MR 1885, p 182; MR 1889–90, pp 24, 40; MR 1891, pp 12, 27
Utah, irrigation facilities and problems in................ Ann 11, II, pp 231–233, 238

Utah, irrigation surveys, engineering, hydrography, segregations, etc., in....Ann 10, II, pp viii, 63, 88; Ann 12, II, pp 325–344

Utah, lead from, statistics of......MR 1882, pp 308–309; MR 1883–84, pp 412, 416–418; MR 1885, pp 248–249; MR 1886, pp 142–143; MR 1887, pp 103–104; MR 1888, p 86; MR 1889–90, p 80; MR 1891, p 105

Utah; lake Bonneville, a Pleistocene lake of Utah ....Ann 2, pp 169–200; Mon I

Utah, mineral springs of..Bull 32, pp 185–187

Utah, minerals of, the useful ....MR 1882, pp 773–775; MR 1887, pp 794–796

Utah, Neocene beds of..Bull 84, pp 312–313

Utah, nitre from, analysis of..Bull 55, p 88

Utah; on the Quaternary and recent Mollusca of the Great basin, with descriptions of new forms, introduced by a sketch of the Quaternary lakes of the Great basin..Bull 11

Utah; oölitic sand from the shore of Great salt lake ....Bull 27, p 69

Utah, ozocerite deposit in..MR 1882, p 609; MR 1883–84, pp 955–957; MR 1888, p 515; MR 1889–90, p 481

Utah, Permian rocks in..Bull 80, pp 220–221

Utah, quicksilver production of ....MR 1886, p 168

Utah, salt from, statistics of......MR 1882, pp 532–534, 549–550; MR 1883–84, pp 827, 844–845; MR 1885, pp 474, 483–484; MR 1886, pp 628, 639–640; MR 1887, pp 611, 622; MR 1888, pp 597–598, 605–607; MR 1889–90, pp 482, 489; MR 1891, p 577

Utah, sandstone production of..MR 1891, pp 461, 463

Utah, slate production of..MR 1891, pp 472, 473

Utah, sulphur production of..................MR 1885, pp 494–496; MR 1886, p 644; MR 1887, p 604; MR 1889–90, p 515; MR 1891, p 564

Utah, topographic work in..Ann 2, pp 13–15

Utah, tyrolite from, analyses of, etc.................Bull 55, pp 41–43; Bull 64, p 40

Utah and Colorado, Tertiaries of, some insects of special interest from the...Bull 93

Utah, Colo., and Wyo., geology and physiography of portions of..Ann 9, pp 677–712

Utah lake drainage system, hydrography of..Ann 11, II, pp 70–74; Ann 12, II, pp 334–339

Utah lake reservoir system..Ann 11, II, pp 184–189

Utah, water from Beck's hot springs, near Salt lake city, analysis of...Bull 42, p 148

Utah, waters from Utah lake, City creek, Bear river, etc., analyses of..Bull 9, pp 29–30

Uwarowite from California, mineralogical description of...............Bull 61, p 30

Vanadium, statistics of..MR 1882, p 449

Vancouver island region, Cretaceous fossils from....................Bull 51, pp 33–48

Van Hise (C. R.), administrative report for 1887–88....................Ann 9, pp 79–84

Van Hise (C. R.), administrative report for 1888–89..............Ann 10, I, pp 123–128

Van Hise (C. R.), administrative report for 1889–90................Ann 11, I, pp 77–80

Van Hise (C. R.), administrative report for 1890–91................Ann 12, I, pp 84–87

Van Hise (C. R.), correlation papers—Archean and Algonkian................Bull 86

Van Hise (C. R.) and Irving (R. D.), secondary enlargements of mineral fragments in certain rocks..Bull 8

Van Hise (C. R.) and Irving (R. D.), the Penokee iron-bearing series of Michigan and Wisconsin ....Ann 10, I, pp 341–507; Mon XIX

Vapor, aqueous, thermal effect of the action of, on feldspathic rocks.........Ann 2, pp 325–330; Mon III, pp 290–308

Vein formation, theories of........Mon III, pp 18–21, 30; Mon VII, pp 80–106, 187–190; Mon XII, p 378; Mon XIII, pp 407–450, 473–475; Mon XX, pp 292–316

Vein formation. See, also, Ore deposits.

Vein materials from the Leadville district, Colo., analyses of.........Mon XII, p 557

Venezuela, copper production of..............................MR 1883–84, pp 356, 374; MR 1885, pp 229, 243; MR 1886, pp 128, 139; MR 1887, pp 88, 96; MR 1888, p 73; MR 1889–90, p 73; MR 1891, p 101

Venezuela, gold production of, compared with that of other countries..........MR 1883–84, pp 319, 320
Venezuela, petroleum localities in..........................MR 1886, pp 486–487
Vermiculites, micas, and chlorites, on the constitution of certain...Bull 90, pp 11–21
Vermilion cliffs and valley of the Virgen, Grand canyon district, description of....................................Ann 2, pp 83–91; Mon II, pp 51–60
Vermont, altitudes in....................................Bull 5, pp 301–303; Bull 76
Vermont, boundary lines of..Bull 13, pp 45–47
Vermont, building stone from, statistics of................MR 1882, pp 451, 452; MR 1886, p 541; MR 1887, pp 513, 518; MR 1888, pp 536, 541; MR 1889–90, pp 373, 432–435; MR 1891, pp 457, 460, 464, 467
Vermont; Cambrian faunas of North America, studies on the..............Bull 30
Vermont, Cambrian, lower, in, literature and fauna of the................Ann 10, I, pp 531–534, 539–541, 569, 583–584
Vermont, Cambrian rocks in, correlation of the.................Bull 81, pp 95, 96, 98, 99, 100, 102, 104, 105, 107, 113, 283, 310–311, 381–382
Vermont, clay, brick, and pottery industry of.........................MR 1882, pp 465, 469; MR 1888, p 563; MR 1891, p 502
Vermont, copper from, statistics of.................Ann 2, p xxix; MR 1882, pp 216, 231; MR 1883–84, pp 329, 343; MR 1885, p 210; MR 1886, p 112; MR 1887, p 69; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83, 84
Vermont, fossils from..Ann 8, II, p 850; Ann 10, I, pp 572–575, 602, 605, 607, 609, 628, 645
Vermont, geologic and paleontologic investigations in.....Ann 5, pp 52, 54; Ann 6, pp 74, 75, 76; Ann 7, pp 60, 157; Ann 8, I, pp 125, 175, 176; Ann 9, p 116; Ann 10, I, pp 114, 160; Ann 11, I, pp 64, 104, 114; Ann 12, I, pp 66, 68, 69, 72, 76, 122
Vermont, geologic maps of, listed.....................Bull 7, pp 54, 55, 56, 57, 161
Vermont, granite production of................................MR 1891, pp 457, 460
Vermont, iron and steel from, statistics of.........................Ann 2, p xxviii; MR 1882, pp 120, 129, 131, 133, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184; MR 1886, pp 17, 42; MR 1891, p 61
Vermont, lime production of.......................MR 1887, p 533; MR 1888, p 556
Vermont, limestone production of..............................MR 1891, pp 464, 467
Vermont, manganese-ore production of.................................MR 1888, pp 124, 131–132; MR 1889–90, pp 127, 135; MR 1891, pp 127, 137
Vermont, marble production of.................................MR 1891, pp 468, 470
Vermont, mineral springs of...............................Bull 32, pp 18–21; MR 1883–84, p 985; MR 1885, p 540; MR 1886, p 719; MR 1887, p 686; MR 1888, p 629; MR 1889–90, p 533; MR 1891, pp 603, 608
Vermont, minerals of, the useful.........MR 1882, pp 736–738; MR 1887, pp 796–799
Vermont, pyrites from, statistics of..............................MR 1885, pp 502–503
Vermont, slate production of..................................MR 1891, pp 472, 473
Vermont, topographic work in.........................Ann 9, p 76; Ann 11, I, p 35
Vertebrate life in America, section to illustrate...........Ann 5, p 253; Mon X, p 7
Vertebrate paleontology of the Newark system.............................Bull 85
Vertebrate remains from the Neocene of Florida...............Bull 84, pp 127–131
Vertebrates, fossil; birds with teeth.................................Ann 3, pp 45–88
Vertebrates, fossil; Dinocerata, an extinct order of gigantic mammals.......Ann 5 pp 243–302; Mon X
Vertebrates, fossil; fishes from the upper Devonian of New York, description of two species of...Bull 41, pp 62–63
Vertebrates, fossil; fishes of the Triassic rocks of New Jersey and the Connecticut valley..Mon XIV, pp 17–76
Vertebrates, fossil; fishes, the Paleozoic, of North America................Mon XVI
Vertebrates, fossil, of Alaska, distribution of the.....................Bull 84, p 266
Vertebrates, fossil, of the higher Devonian of Ontario county, New York...Bull 16, pp 17–20, 40–43

Vicksburg group of rocks of La., Miss., and Fla ...... Bull 83, pp 69–70, 76, 101–103

Vicksburg-Jackson limestone.......Ann 12, I, pp 412–413

Victoria, antimony production of.......MR 1883–84, pp 646–648

Virgen, valley of the, and Vermilion cliffs, Grand canyon district, description of.......Ann 2, pp 83–91; Mon II, pp 51–60

Virginia, altitudes in.......Bull 5, pp 304–311; Bull 76

Virginia, boundary lines of.......Bull 13, pp 88–92

Virginia, brick industry of.......MR 1887, pp 536, 539; MR 1888, pp 563–564

Virginia, building stone from, statistics of......MR 1882, pp 451, 452; MR 1887, p 514; MR 1888, p 536; MR 1889–90, pp 373, 435–437; MR 1891, pp 457, 460, 461, 463, 467

Virginia, cement industry in ....MR 1891, p 532

Virginia, clay deposits of.......MR 1891, p 505

Virginia, Cambrian rocks of, correlation of the....Bull 81, pp 133–138, 290–299, 311, 383

Virginia, coal area and statistics of.......Ann 2, p xxviii; MR 1882, p 82; MR 1883–84, pp 12, 90–98; MR 1885, pp 11, 69; MR 1886, pp 225, 230, 352–356; MR 1887, pp 169, 171, 360–367; MR 1888, pp 169, 171, 377–381; MR 1889–90, pp 146, 272–275; MR 1891, pp 180, 330–331

Virginia, coke in, the manufacture of.......MR 1883–84, pp 204–205; MR 1885, pp 80, 117–119; MR 1886, pp 378, 384, 422–423; MR 1887, pp 383, 389, 421; MR 1888, pp 395, 400, 425–426; MR 1891, pp 360, 366, 395–396

Virginia; coke, "natural," from Midlothian, analysis of.......Bull 42, p 146

Virginia, copper mining in.......MR 1882, p 231

Virginia, Cretaceous deposits of.......Bull 82, pp 90–91

Virginia, Eocene deposits of.......Bull 83, pp 46–48, 80, 86

Virginia, forestry investigations in.......Ann 5, pp 64–66; Ann 6, p 93; Ann 7, p 135

Virginia, fossils from.......Ann 4, pp 311, 312, 313, 314; Ann 8, II, pp 873–876

Virginia, geologic and paleontologic investigations in......Ann 5, p 53; Ann 6, pp 24, 31, 86; Ann 7, pp 63, 66, 110, 123, 124; Ann 8, I, pp 170, 188; Ann 9, pp 77, 78; Ann 10, I, pp 118, 120, 121, 156; Ann 11, I, pp 71, 72, 109, 116, 117; Ann 12, I, pp 54, 79, 125

Virginia, geologic maps of, listed.....Bull 7, pp 103, 106, 107, 108, 109, 110, 111, 112, 167

Virginia; geology of the Dismal swamp district of Virginia and North Carolina.......Ann 10, I, pp 313–339

Virginia, gold from, statistics of......Ann 2, p 385; MR 1882, pp 172, 176, 177, 178; MR 1883–84, pp 312, 313; MR 1885, p 201; MR 1886, p 104; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 76, 77

Virginia, granite production of ....MR 1891, pp 457, 460

Virginia, gypsum production of.......MR 1891, pp 580, 582

Virginia, iron and steel from, statistics of.......Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, pp 252, 276–277; MR 1885, pp 182, 184, 186; MR 1886, pp 18, 33, 77–81, 98; MR 1887, pp 11, 16; MR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 12, 17, 24, 40; MR 1891, pp 12, 23, 54, 55, 61

Virginia, lead from, statistics of.......Ann 2, p xxviii; MR 1883–84, p 416; MR 1885, p 248

Virginia, lime production of.......MR 1888, p 556

Virginia; limestone from Lexington, analysis of ....Bull 42, p 137

Virginia, limestone production of ....MR 1891, p 467

Virginia, manganese deposits in.......MR 1882, p 424; MR 1883–84, pp 551–552; MR 1885, pp 305, 307–328; MR 1886, pp 181, 194–196; MR 1887, pp 145, 146, 151–152; MR 1888, pp 124, 125, 132–133; MR 1889–90, pp 127, 135; MR 1891, pp 127, 137

Virginia, marble production of.......MR 1891, p 470

Virginia, Mesozoic flora of, the older.......Mon VI

Virginia; meteoric iron from Pulaski co., description and analysis of..Bull 90, p 45

Virginia, mineral springs of........................Bull 32, pp 54–68; MR 1883–84, p 985; MR 1885, p 541; MR 1886, p 719; MR 1887, p 686; MR 1888, p 629; MR 1889–90, p 533; MR 1891, pp 603, 608
Virginia, minerals of, the useful..........MR 1882, pp 738–743; MR 1887, pp 799–803
Virginia, Neocene beds of..Bull 84, pp 55–67
Virginia, ocher production of ....MR 1891, p 595
Virginia; Potomac or younger Mesozoic flora..................................Mon xv
Virginia, pyrites from, statistics of........................MR 1883–84, pp 879–880; MR 1885, pp 504–505; MR 1886, pp 653–654
Virginia; pyrolusite from the Crimora mine, analysis of...........MR 1883–84, p 551
Virginia, rocks and coal of ....Bull 80, pp 29, 86, 112–113
Virginia, salt from, statistics of..................................MR 1882, pp 532–534; MR 1883–84, p 840; MR 1891, p 572
Virginia, sandstone production of...............................MR 1891, pp 461, 463
Virginia, slate production of......................................MR 1891, pp 472, 473
Virginia; spessartite from Amelia county, description and analysis of..Bull 60, p 129
Virginia, tin ore in....MR 1883–84, pp 599–601; MR 1885, pp 371–376; MR 1891, p 164
Virginia, topographic work in.......................................Ann 4, pp 13–15; Ann 5, p 5; Ann 6, p 8; Ann 7, pp 50, 51; Ann 8, I, p 101; Ann 9, pp 52–53, 54, 55; Ann 10, I, p 90; Ann 11, I, p 36; Ann 12, I, p 27
Virginia; waters from springs in Loudoun county, analyses of ....Bull 42, p 147
Virginia; waters from Virginia hot springs, Bath co., analyses of...Bull 9, pp 33–35
Virginia, zinc and zinc works in......................Ann 2, p xxix; MR 1882, p 365
Virginia, Nevada, and immediate vicinity, geological map of......Ann 2, pp 292–293
Virginia-New York area of the Newark system................Bull 85, pp 20–21, 83–85
Viscosity of solids..Bull 73
Viscosity, solid, the mechanism of...Bull 94
Viscosity, the pyrometric use of the principle of..................Bull 54, pp 239–306
Vishnu series of rocks in Arizona................................Bull 86, pp 330–332
Vogdes (A. W.), bibliography of Paleozoic Crustacea from 1698 to 1889, including a list of North American species and a systematic arrangement of genera ....Bull 63
Volatility, coefficients of, for aqueous chlorhydric acid ....Bull 60, pp 115–117
Volcanic action in the Eureka district, Nevada ....Mon xx, pp 230–291
Volcanic action in the Grand canyon district..................Ann 2, pp 118–119, 122; Mon II, pp 81–83, 94–97, 104–112, 120–121
Volcanic activity in the Great basin during the epoch of lake Bonneville......Ann 2, pp 190–192; Mon I, pp 319–339
Volcanic activity. See, also, Solfataric action.
Volcanic areas around the borders of the Plateau country, description of, and map showing the..Ann 6, pp 118–121
Volcanic center, Eureka, Nevada, a.....................................Mon xx, p 230
Volcanic cones and craters of the Uinkaret plateau, basaltic..................Ann 2, pp 118, 121–124; Mon II, pp 104–109
Volcanic dust from Idaho, Montana, and Nebraska, analyses of ..Bull 42, pp 141–142
Volcanic dust from Lahontan beds, description and analyses of..............Mon XI, pp 146–149; Bull 9, p 14
Volcanic eruption in northern California (a late one) and its peculiar lava...Bull 79
Volcanic eruptions, Pleistocene, of western United States ....Mon I, pp 336–337
Volcanic lavas of Eureka dist., Nev., manner of occurrence of....Mon xx, pp 243–249
Volcanic necks, columnar structure of basalt in........................Ann 6, pp 172–174
Volcanic necks in northwestern New Mexico..........................Ann 6, pp 167–178
Volcanic phenomena, deposition of quicksilver in relation to ....Mon XIII, pp 52, 417
Volcanic phenomena, recent and Quaternary, of Mono valley, California.....Ann 8, I, pp 371–389

Volcanic rocks from the Tewan mountains, New Mexico, a group of, and the occurrence of primary quartz in certain basalts........Bull 66
Volcanic rocks of Sepulchre mountain, Yellowstone park........Ann 12, I, pp 634–650
Volcanic rocks of the Eureka district, Nevada........Ann 3, pp 277–287; Mon xx, pp 230, 249–253, 348–394
Volcanic rocks of the Penokee series, lake Superior district........Ann 10, I, pp 439–444
Volcanic rocks of Washoe, Nevada, chemical analyses of........Bull 17, p 33
Volcanic rocks, stratified, of mount Desert id., Me..Ann 8, II, pp 1037, 1043–1047, 1051
Volcanic rocks. See, also, Igneous rocks.
Volcanic soils, origin and nature of........Ann 12, I, pp 239–245
Volcanic source of the heat of the Comstock lode........Mon III, pp 240–241
Volcanism; dike of peridotite in Kentucky........Bull 38
Volcanism in Alaska........Bull 84, p 268
Volcanism in relation to diastrophism in the Sierra nevada........Ann 8, I, pp 428–430
Volcanism; traps of the Newark system, N. J. region, relations of the........Bull 67
Volcanoes, cause of, the problem of the........Ann 4, pp 183–198
Volcanoes, Hawaiian........Ann 4, pp 75–219
Volcanoes, relation of, to mountain structure in the Rocky mountains..Mon XII, p 27
Volcanoes. See, also, Igneous rocks.
Vulcanized India rubber, the solution of........Bull 92, pp 85–94
Wages and labor at coal mines of the United States........MR 1889–90, pp 169–171; MR 1891, pp 203–204
Walcott (C. D.), administrative report for 1882–83........Ann 4, pp 44–48
Walcott (C. D.), administrative report for 1883–84........Ann 5, pp 52–55
Walcott (C. D.), administrative report for 1884–85........Ann 6, pp 74–78
Walcott (C. D.), administrative report for 1885–86........Ann 7, pp 113–117
Walcott (C. D.), administrative report for 1886–87........Ann 8, I, pp 174–178
Walcott (C. D.), administrative report for 1887–88........Ann 9, pp 115–120
Walcott (C. D.), administrative report for 1888–89........Ann 10, I, pp 160–162
Walcott (C. D.), administrative report for 1889–90........Ann 11, I, pp 102–106
Walcott (C. D.), administrative report for 1890–91........Ann 12, I, pp 106–111
Walcott (C. D.), Cambrian faunas of North America........Bull 10; Bull 30
Walcott (C. D.), correlation papers—Cambrian........Bull 81
Walcott (C. D.), paleontology of the Eureka district........Mon VIII
Walcott (C. D.), systematic list of fossils of each geological formation in the Eureka district, Nevada........Mon xx, pp 317–333
Walcott (C. D.), the fauna of the lower Cambrian or Olenellus zone........Ann 10, I, pp 509–763
Walcott (C. D.), the North American continent during Cambrian time....Ann 12, I, pp 523–568
Wales, Cambrian rocks of........Bull 81, pp 373–374
Wales, fossil plants of, literature of the........Ann 8, II, pp 683–684
Wales, lower Cambrian strata and fauna of........Ann 10, I, p 580
Wales, phosphate deposits of........Bull 46, pp 80–84
Wales. See, also, Great Britain.
Walker (J. A.), graphite, statistics of...MR 1882, pp 590–594; MR 1883–84, pp 915–919
Walker lake and river, Nevada, analysis of water of........Mon XI, pp 46, 70
Ward (L. F.), administrative report for 1881–82........Ann 3, pp 26–29
Ward (L. F.), administrative report for 1882–83........Ann 4, pp 50–51
Ward (L. F.), administrative report for 1883–84........Ann 5, pp 55–59
Ward (L. F.), administrative report for 1884–85........Ann 6, pp 81–85
Ward (L. F.), administrative report for 1885–86........Ann 7, pp 123–126
Ward (L. F.), administrative report for 1886–87........Ann 8, I, pp 184–188
Ward (L. F.), administrative report for 1887–88........Ann 9, pp 128–131
Ward (L. F.), administrative report for 1888–89........Ann 10, I, pp 169–175

Ward (L. F.), administrative report for 1889-90..................Ann 11, I, pp 114-123
Ward (L. F.), administrative report for 1890-91..................Ann 12, I, pp 120-125
Ward (L. F.), geographical distribution of fossil plants ....Ann 8, II, pp 663-960
Ward (L. F.), sketch of paleobotany..................................Ann 5, pp 357-452
Ward (L. F.), synopsis of the flora of the Laramie group...........Ann 6, pp 399-557
Ward (L. F.), types of the Laramie flora..................................Bull 37
Warder (R. B.), coefficients of volatility for aqueous chlorhydric acid.......Bull 60, pp 115-117
Warwickite from Edenville, Orange county, New York, analysis of.....Bull 64, p 41
Wasatch group of rocks, literature and correlation of the ....Bull 83 pp 117-126, 139, 145-146
Wasatch mountains, Archean and Algonkian literature of the....Bull 86, pp 289-295
Wasatch mountains, geologic section of the......Ann 2, p 217; Ann 10, I, pp 549-550; Mon XII, p 58; Mon XX, p 206; Bull 30, p 37; Bull 81, p 157
Wasatch mountains, recent growth of the, the testimony of the Bonneville shorelines to the..............................Ann 2, pp 197-200; Mon I, p 359
Washington, altitudes in.........Bull 5, pp 312-313; Bull 72, pp 196, 225-226; Bull 76
Washington, boundary lines of, and formation of territory....Bull 13, pp 31, 128-129
Washington, brick industry of..MR 1888, p 564
Washington, building stone from, statistics of.........................MR 1882, p 451; MR 1889-90, pp 373, 437; MR 1891, pp 461, 463, 464, 468
Washington, Chico-tejon series of rocks in ....Bull 51, pp 28-32
Washington, clay deposits of.......................................MR 1891, pp 525-526
Washington, coal area and statistics of ....Ann 2, p xxviii; MR 1882, pp 95-96; MR 1883-84, pp 12, 99-100; MR 1885, pp 11, 70; MR 1886, pp 225, 230, 357-367; MR 1887, pp 169, 171, 367-373; MR 1888, pp 170, 171, 381-385; MR 1889-90, pp 147, 275-276; MR 1891, pp 180, 331-341
Washington, coke in, the manufacture of ....MR 1883-84, p 206; MR 1885, pp 80, 119-120; MR 1886, pp 378, 384, 423; MR 1887, pp 383, 389, 422; MR 1888, pp 395, 400, 426-427; MR 1891, pp 360, 361, 366, 396
Washington, constitution of, extract from the, relating to irrigation..Ann 11, II, p 241
Washington, Cretaceous rocks of..................... Bull 82, pp 181, 183, 184, 187, 194
Washington, fossils from...Ann 8, II, pp 923-924
Washington, glaciers, existing, of the United States.................Ann 5, pp 303-355
Washington, gold and silver from, statistics of ....Ann 2, p 385; MR 1882, pp 172, 174, 176, 177, 178, 182; MR 1883-84, pp 312, 313, 314, 315; MR 1885, pp 201, 203; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889-90, p 49; MR 1891, pp 75, 77, 78, 79
Washington, iron and steel from, statistics of ....MR 1882, pp 129, 131; MR 1883-84, pp 252, 288; MR 1885, p 182; MR 1886, p 18; MR 1887, p 11; MR 1888, p 15; MR 1889-90, pp 10, 17, 40
Washington, limestone production of...........................MR 1891, pp 464, 468
Washington, mineral springs of.................................Bull 32, pp 217-218; MR 1889-90, p 534; MR 1891, pp 603, 608
Washington, minerals of, the useful ....MR 1882, p 775; MR 1887, pp 803-804
Washington, Neocene deposits of..................................Bull 84, pp 227-230
Washington; Puget group, the Molluscan fauna of the.............Bull 51, pp 49-63
Washington, river courses in, changes in, due to glaciation ....Bull 40
Washington, sandstone production of..........................MR 1891, pp 461, 463
Washington, Tejon and Puget strata of...........................Bull 83, pp 103, 107
Washington, Oregon, and California, Cenozoic epoch in, general considerations on the..Bull 84, pp 269-273
Washington (H. S.) and Hillebrand (W. F.), notes on certain rare copper minerals from Utah...Bull 55, pp 38-47
Washoe district, Nev., development of crystallization in igneous rocks of....Bull 17
Washoe district, Nevada, rocks from the, analyses of....Mon XX, p 282; Bull 17, p 33

Washoe district and Comstock lode, Nevada, geology of the..................Ann 2, pp xxiv-xxvi, 291-330; Mon III and atlas
Washoe district, Nevada. See, also, Comstock lode.
Water above 100°, the compressibility of, and its solvent action on glass....Bull 92, pp 78-84
Water, action of, in formation of cherty iron carbonates ....Ann 10, I, p 395
Water, action of, in formation of iron ores ....Ann 10, I, pp 415-417
Water, analyses of, from—

- Alabama:
  - artesian well at Fitzpatrick's..Bull 55, p 91
- Arkansas:
  - Happy hollow spring..Bull 55, p 92
  - Potash sulphur springs, Garland county ....Bull 55, p 92
  - springs at Hominy hill...Bull 60, p 173
- California:
  - Borax lake...Mon XIII, p 265
  - Honey lake valley...Bull 9, p 28
  - lake Tahoe ....Mon XI, p 42; Bull 9, p 28
  - Matilija hot springs near San Buenaventura...................... Bull 60, p 174
  - Mono lake..................Ann 8, I, pp 292-296; Bull 9, pp 26, 27; Bull 42, p 149
  - Owens lake.....................................Ann 8, I, p 295; Bull 55, p 93
  - Sulphur bank.. Mon XIII, p 259
  - Truckee river..Mon XI, p 225
- Colorado:
  - spring near Denver ....Bull 60, p 174
- Florida:
  - artesian wells at St. Augustine..Bull 64, p 59
- Georgia:
  - artesian well at Albany ....Bull 55, p 91
  - artesian well at Americus ....Bull 55, p 91
  - artesian well at Montezuma ....Bull 55, p 91
  - artesian well at Smithville ....Bull 55, p 91
  - Savannah river and artesian well at Savannah ....Bull 55, p 91; Bull 64, p 59
- Illinois:
  - spring at McLeansborough ....Bull 60, p 172
- Iowa:
  - artesian wells at Story city .... Bull 42, p 148
- Kentucky:
  - Murray well, one mile north of Frankfort..............................Bull 64, p 57
- Maine:
  - spring near Paris..Bull 55, p 91
- Mississippi:
  - well near Clinton ....Bull 64, p 60
- Missouri:
  - spring at Webster grove, near St. Louis............................ Bull 78, p 129
  - well at Lebanon, Laclede county ....Bull 60, p 172
- Montana:
  - Emigrant gulch warm springs, Yellowstone valley.....................Bull 9, p 31
  - Helena hot springs...Bull 9, p 32
  - Livingston warm springs..Bull 9, p 31
  - Matthews' warm springs, near Bozeman ....Bull 27, p 75
  - Mill creek cold spring, Yellowstone valley ....Bull 9, p 32
  - White sulphur springs, Meagher county..............................Bull 27, p 75
- Nevada:
  - hot spring, foot of Granite mountain..................................Bull 9, p 24
  - hot spring at Hot spring station, C. P. R. R..............................Bull 9, p 24

Water, analyses of, from—continued.
  Nevada—continued.
    Humboldt lake and river ....Mon XI, pp 41, 67, 225; Bull 9, p 23
    Pyramid lake..............................Mon XI, pp 57, 58, 225; Bull 9, pp 20–21
    Soda lakes...Mon XI, p 77; Bull 9, p 25
    Steamboat springs ....Mon XIII, pp 346, 350
    Walker lake and river.....................Mon XI, pp 46, 70, 225; Bull 9, pp 22–23
    Winnemucca lake...............................Mon XI, pp 63, 225; Bull 9, p 21
  New Mexico:
    mineral spring one mile west of Santa Fé.........................Bull 27, p 76
    spring near fort Wingate...Bull 55, p 92
  New Zealand:
    springs..Ann 9, p 673
  North Carolina:
    spring twenty miles from Charlotte, Lincoln county ....Bull 60, p 171
  Oregon:
    Abert lake ....Bull 9, p 29
  Tennessee:
    spring at Mountain city..Bull 64, p 58
  Utah:
    Bear river ....Bull 9, p 30
    Beck's hot springs, near Salt lake city ....Bull 42, p 148
    City creek ....Bull 9, p 29
    Great salt lake...Mon I, pp 253, 254, 255
    Utah hot springs, eight miles north of Ogden ....Bull 9, p 30
    Utah lake...Bull 9, p 29
  Virginia:
    springs in Loudoun county..Bull 42, p 147
    Virginia hot springs, Bath county ....Bull 9, p 33
  Yellowstone national park:
    Mammoth hot springs ....Ann 9, p 639
Water, apparatus for determination of, in mineral analysis ....Bull 78, pp 84–86
Water, artesian, chemical impregnations of.........................Ann 5, pp 165–167
Water, artesian; requisite and qualifying conditions of artesian wells........Ann 5, pp 125–173
Water, artesian, temperature of....................................Ann 5, p 165
Water-bearing beds, character of...................................Ann 5, pp 135–137
Water, river, general chemistry of.................................Mon XI, pp 172–174
Water, spring, general chemistry of................................Mon XI, pp 175–178
Water supply, dangerous, conditions of ....Ann 12, I, pp 342–344
Water supply of Mono lake, California ....Ann 8, I, p 287
Water supply of the Colorado river.................................Mon II, pp 234–235
Water vapor, influence of, in producing fayalite and various structures in obsidian ....Ann 7, pp 280–287
Water vapor, rôle of, in molten magmas.............................Bull 66, pp 26–29
Waters and wells, artesian, for irrigation in western United States and in various countries..........Ann 11, II, pp 257–278
Waters, geyser, analyses of..Ann 9, p 655
Waters, mineral, of the United States, lists and analyses of the ....Bull 32
Waters, mineral, statistics of......................................MR 1883–84, pp 978–987; MR 1885, pp 536–543; MR 1886, pp 715–721; MR 1887, pp 680–687; MR 1888, pp 623–630; MR 1889–90, pp 521–535; MR 1891, pp 601–610
Waters, natural, treatment of, in analysis.........................Bull 47, pp 12–25
Waters of Comstock lode, source and temperatures of...Mon III, pp 241–243, 252, 390
Waters of Comstock mines, analyses of..............................Mon III, p 152

Waters of rivers, springs, oceans, and inland seas, chemistry of..Mon xi, pp 172–187

Waters of the Yellowstone national park, analyses of, with an account of the methods of analysis employed ....Bull 47

Wave motion, especially in solid media, nature and mechanism of..Ann 9, pp 390–409

Wave work on shores............Ann 5, pp 80–99; Mon i, pp 29–60; Mon xi, pp 88–99

Weathering, analysis of, and the results of, in the Grand canyon..............Ann 2, pp 161–166; Mon ii, pp 245–249

Weathering of rocks and origin of the red color of certain formations ....Bull 52

Weathering of rocks producing nodules, discussion of............Mon xiii, pp 68–72

Weathering, products of, in massive rocks.......................Bull 62, pp 213–214

Weathering. See, also, Degradation.

Webber lake, California, surveyed as a reservoir site......Ann 11, ii, pp 175, 181–182

Weber and Ogden rivers, Utah, hydrography of ....Ann 12, ii, p 334

Weber conglomerate at Eureka, Nevada..............................Mon xx, pp 91–92

Webster (A. L.), altitudes and their determination..................Mon i, pp 405–419

Websterite from North Carolina and Maryland, analyses of ....Bull 78, p 122

Weed (W. H.), travertine and siliceous sinter of hot springs ......Ann 9, pp 613–676

Weeks (J. D.), glass materials, statistics of.............................MR 1883–84, pp 958–977; MR 1885, pp 544–557

Weeks (J. D.), manganese, statistics of...MR 1885, pp 303–356; MR 1886, pp 180–213; MR 1887, pp 144–167; MR 1888, pp 123–143; MR 1889–90, pp 127–136; MR 1891, pp 126–146

Weeks (J. D.), natural gas, statistics of...MR 1885, pp 155–179; MR 1886, pp 488–516; MR 1887, pp 464–502; MR 1888, pp 481–512; MR 1889–90, pp 366–372; MR 1891, pp 436–451

Weeks (J. D.), petroleum, statistics of...MR 1886, pp 439–487; MR 1887, pp 436–463; MR 1888, pp 442–480; MR 1889–90, pp 287–365; MR 1891, pp 403–435

Weeks (J. D.), the manufacture of coke, statistics of.......MR 1883–84, pp 144–213; MR 1885, pp 74–129; MR 1886, pp 378–438; MR 1887, pp 383–435; MR 1888, pp 395–441; MR 1891, pp 357–402

Weiser river basin, Idaho, hydrography of..................Ann 11, ii, pp 89–92, 106

Wells, artesian, requisite and qualifying conditions of.............Ann 5, pp 125–173

Wells, artesian, in Kansas ....Ann 11, ii, p 271; Bull 57, pp 13, 30, 48

Wells, artesian, irrigation by ....Ann 5, pp 148–150; Ann 11, ii, pp 257–278

Wells, the art of sinking..Ann 5, pp 168–170

West Indies, fossil plants of, literature of the ....Ann 8, ii, pp 819–820

West Indies, geological maps of, listed ....Bull 7, pp 146–148

West Virginia, altitudes in..............................Bull 5, pp 314–316; Bull 76

West Virginia; bituminous coal field in Pennsylvania, Ohio, and West Virginia, stratigraphy of the ....Bull 65

West Virginia, boundary lines of ....Bull 13, p 92

West Virginia, brick industry of...........MR 1887, p 536; MR 1888, pp 564, 566, 569

West Virginia, bromine industry of ....MR 1883–84, pp 851–852; MR 1885, pp 846–847; MR 1886, p 642; MR 1887, p 626; MR 1888, p 613; MR 1889–90, p 493; MR 1891, p 579

West Virginia, building stone from, statistics of....MR 1882, p 451; MR 1887, p 521; MR 1889–90, pp 373, 437–438; MR 1891, pp 461, 463, 464, 468

West Virginia, clay deposits and industry of ....MR 1891, p 515

West Virginia, coal area and statistics of........Ann 2, p xxviii; MR 1882, pp 83–85; MR 1883–84, pp 12, 90–98; MR 1885, pp 11, 71; MR 1886, pp 225, 230, 369–374; MR 1887, pp 169, 171, 373–379; MR 1888, pp 169, 171, 385–389; MR 1889–90, pp 147, 277–280; MR 1891, pp 180, 341–351

West Virginia; coal from Jefferson county, analysis of..................Bull 42, p 146

West Virginia; coal from Randolph county, analyses of.............Bull 27, pp 73–74

West Virginia, coal and coke from, analyses of...........................Bull 64, p 54

West Virginia; coal and coke from near Piedmont, analyses of........Bull 60, p 169

West Virginia, Coal measures of..................................Bull 80, pp 87, 88

West Virginia; coal mining in the Kanawha valley......... MR 1883–84, pp 131–143

West Virginia; coals from Barbour county, analyses of................Bull 78, p 128

West Virginia, coke in, the manufacture of.................MR 1883–84, pp 207–213; MR 1885, pp 80, 120–129; MR 1886, pp 378, 384, 424–429; MR 1887, pp 383, 389, 422–431; MR 1888, pp 395, 427–441; MR 1891, pp 360, 366, 396–401

West Virginia, forestry investigations in ....Ann 5, pp 64–66; Ann 6, p 93

West Virginia, fossils from ....Ann 8, ii, p 876

West Virginia, geologic and paleontologic investigations in.........Ann 5, pp 52, 53; Ann 6, pp 24, 25, 31, 36; Ann 7, pp 65, 67; Ann 8, i, p 130; Ann 9, p 77; Ann 10, i, pp 119–120; Ann 12, i, pp 55, 78

West Virginia, geologic maps of, listed...............................Bull 7, pp 109, 111, 112

West Virginia, iron and steel from, statistics of...........Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 134, 135, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184, 186; MR 1886, pp 18, 33, 81; MR 1887, pp 11, 16; MR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 12, 17, 24, 34; MR 1891, pp 12, 27, 54, 55, 61

West Virginia; iron ore, brown, from Randolph county, analyses of..Bull 27, pp 72–73

West Virginia, limestone production of ....MR 1891, pp 464, 468

West Virginia; limestones from below Wheeling, analyses of............Bull 9, p 17

West Virginia; limonite from Canaan mountain, analysis of.............Bull 9, p 18

West Virginia, mineral springs of.............Bull 32, pp 69–73; MR 1883–84, p 985; MR 1885, p 541; MR 1886, p 719; MR 1887, p 686; MR 1888, p 629; MR 1889–90, p 534; MR 1891, pp 603, 608

West Virginia, minerals of, the useful.....MR 1882, pp 743–745; MR 1887, pp 804–806

West Virginia, mining laws of....................................MR 1886, pp 741–746

West Virginia, natural-gas localities and statistics of...MR 1883–84, pp 236, 237, 243; MR 1885, p 167; MR 1886, p 504; MR 1887, pp 466, 484; MR 1889–90, p 367; MR 1891, p 438

West Virginia, petroleum localities and statistics of.................MR 1882, p 189; MR 1883–84, p 216; MR 1885, pp 146–147; MR 1886, p 441; MR 1887, pp 438, 451, 463; MR 1889–90, pp 292, 329–332; MR 1891, pp 405, 407, 431

West Virginia, salt from, statistics of....MR 1882, pp 532–534, 539–541; MR 1883–84, pp 827, 839–840; MR 1885, pp 474, 479; MR 1886, pp 628, 637; MR 1887, pp 611, 620; MR 1888, pp 597–598, 604; MR 1889–90, pp 482, 488; MR 1891, p 572

West Virginia, sandstone production of ....MR 1891, pp 461, 463

West Virginia, topographic work in ....Ann 5, pp 6–8; Ann 6, pp 8, 9, 10; Ann 7, 50, 51, 53; Ann 8, i, p 101; Ann 9, p 53; Ann 10, i, p 92; Ann 11, i, p 37; Ann 12, i, p 27

West Virginia; Wheeling deep well (4,471 feet), determination of underground temperature gradients at the...............................Ann 12, i, p 63

Wet and Sangre de Cristo mountains, Colorado, Archean and Algonkian literature of the ....Bull 86, pp 313–314

Whetstones and oilstones, statistics of.....MR 1889–90, p. 460; MR 1891, pp 553–555

White (C. A.), administrative report for 1882–83 ....Ann 4, pp 42–44

White (C. A.), administrative report for 1883–84 ....Ann 5, pp 50–51

White (C. A.), administrative report for 1884–85 ....Ann 6, pp 72–74

White (C. A.), administrative report for 1885–86 ....Ann 7, pp 117–120

White (C. A.), administrative report for 1886–87 ....Ann 8, pp i, 178–181

White (C. A.), administrative report for 1887–88 ....Ann 9, pp 120–123

White (C. A.), administrative report for 1888–89................Ann 10, i, pp 162–165

White (C. A.), administrative report for 1889–90................Ann 11, i, pp 107–109

White (C. A.), administrative report for 1890–91 ....Ann 12, i, pp 112–115

White (C. A.), correlation papers, Cretaceous ....Bull 82

White (C. A.), fossil Ostreidæ of North America.................Ann 4, pp 273–430

White (C. A.), fresh-water invertebrates of the North American Jurassic....Bull 29
White (C. A.), geology and physiography of portions of Colorado, Utah, and Wyoming ....Ann 9, pp 677–712
White (C. A.), invertebrate fossils from the Pacific coast....................Bull 51
White (C. A.), marine Eocene, fresh-water Miocene, and other fossil Mollusca of western North America ....Bull 18
White (C. A.), Mesozoic and Cenozoic paleontology of California............Bull 15
White (C. A.), Mesozoic fossils ....Bull 4
White (C. A.), new Cretaceous fossils from California........................Bull 22
White (C. A.), nonmarine fossil Mollusca of North America...................Ann 3, pp. 403–550; Bull 18, pp 17–19
White (C. A.), remarks on the genus Aucella, with especial reference to its occurrence in California.....................................Mon XIII, pp 226–232
White (C. A.), the relation of the Laramie Molluscan fauna to that of the succeeding fresh-water Eocene and other groups ....Bull 34
White (C. A.), the Texan Permian and its Mesozoic types of fossils...........Bull 77
White (D.), flora of the outlying Carboniferous basins of southwestern Missouri ....Bull 98
White (I. C.), comparative stratigraphy of the bituminous coal field of the northern half of the Appalachian field ....Bull 65
White Mountains, Archean and Algonkian literature of the ....Bull 86, 350–352
White pine shale at Eureka, Nevada........................Mon XX, pp 68–70, 153–154
White river group of rocks of South Dakota, Colorado, and Wyoming .....Bull 84, pp 289–292, 304–305, 311–312
Whitfield (J. E.), a new meteorite from Mexico ....Bull 64, pp 29–30
Whitfield (J. E.), analyses of natural borates and borosilicates.....Bull 55, pp 56–62
Whitfield (J. E.), analyses of six new meteorites ....Bull 60, pp 103–114
Whitfield (J. E.), dumortierite from New York and Arizona......Bull 60, pp 133–135
Whitfield (J. E.), meteorites from Johnson county, Arkansas, and Allen county, Kentucky ....Bull 55, pp 63–64
Whitfield (J. E.), scorodite from the Yellowstone national park....Bull 55, pp 65–66
Whitfield (J. E.), the indirect estimation of chlorine, bromine, and iodine by the electrolysis of their silver salts, with experiments on the convertibility of the silver salts by the action of alkaline haloids.....Bull 42, pp 89–93
Whitfield (J. E.) and Diller (J. S.), dumortierite from Harlem, New York, and Clip, Arizona ....Bull 64, pp 31–33
Whitfield (J. E.) and Gooch (F. A.), analyses of waters of the Yellowstone national park, with an account of the methods of analysis employed..Bull 47
Whitfield (R. P.), Brachiopoda and Lamellibranchiata of the Raritan clays and greensand marls of New Jersey ....Mon IX
Whitfield (R. P.), Gasteropoda and Cephalopoda of the Raritan clays and greensand marls of New Jersey....................................Mon XVIII
Whiting (H. L.), successive surveys in Martha's vineyard by......Ann 7, pp 361–363
Whitney (J. D.), hypsometric method of ....Ann 2, pp 465–479
Wilber (F. A.), apatite, statistics of....................................MR 1882, p 521
Wilber (F. A.), clays, statistics of ....MR 1883–84, pp 676–711
Wilber (F. A.), fire-clay in the eastern division ....MR 1882, pp 465–469
Wilber (F. A.), gypsum, statistics of ....MR 1883–84, pp 809–815
Wilber (F. A.), marls, statistics of..........MR 1882, pp 522–526; MR 1883–84, p 808
Willemite from the Trotter mine, Franklin, New Jersey, description and analysis of...Bull 60, p 130
Williams (A.), jr., administrative report for 1882–83 ....Ann 4, pp 59–72
Williams (A.), jr., administrative report for 1883–84...................Ann 5, pp 63–64
Williams (A.), jr., administrative report for 1884–85 ....Ann 6, pp 88–93
Williams (A.), jr., administrative report for 1885–86..................Ann 7, pp 130–134

Williams (A.), jr., gold and silver conversion tables .... Bull 2

Williams (A.), jr., list of ores, minerals, and mineral substances of industrial importance in Idaho .... MR 1882, pp 770–771

Williams (A.), jr., mineral resources of the United States in 1882 .... MR 1882

Williams (A.), jr., mineral resources of the United States in 1883 and 1884 . MR 1883–84

Williams (A.), jr., popular fallacies regarding precious-metal ore deposits .... Ann 4, pp 253–271

Williams (A.), jr., useful minerals of the United States; a list by states .... MR 1887, pp 688–812

Williams (G. H.), gabbros and associated hornblende rocks near Baltimore, Maryland .... Bull 28

Williams (G. H.), reports on studies of the crystalline rocks of Maryland .... Ann 10, I, pp 152–154; Ann 11, I, pp 66–67; Ann 12, I, pp 73–74

Williams (G. H.), the greenstone-schist areas of the Menominee and Marquette regions of Michigan, a contribution to the subject of dynamic metamorphism in eruptive rocks .... Bull 62

Williams (H. S.), correlation papers—Devonian and Carboniferous .... Bull 80

Williams (H. S.), fossil faunas of the upper Devonian, along the meridian of 76° 30′ in New York .... Bull 3

Williams (H. S.), fossil faunas of the upper Devonian, the Genesee section, New York .... Bull 41

Williamson (R. S.), hypsometric method of .... Ann 2, pp 452–465

Williamson (William Crawford), biographical sketch of .... Ann 5, p 376

Willis (B.), administrative report for 1888–89 .... Ann 10, I, pp 119–122

Willis (B.), administrative report for 1889–90 .... Ann 11, I, pp 70–73

Willis (B.), administrative report for 1890–91 .... Ann 12, I, pp 78–81

Willis (B.), changes in river courses in Washington due to glaciation .... Bull 40

Willis (B.), lignites of the great Sioux reservation .... Bull 21

Wilson (H. M.), irrigation in India .... Ann 12, II, pp 363–561

Wind-blown soils .... Ann 12, I, pp 326–329

Wind river group of rocks, correlation of the .... Bull 83, pp 115–125, 140–141, 145–146

Wind river mountains, Archean and Algonkian literature of the .... Bull 86, pp 279–280

Wind, the trade, confined within narrow vertical limits .... Ann 4, p 145

Winds in the lake Bonneville basin in Pleistocene time .... Mon I, p 332

Winnemucca lake, Nevada, analysis of water of .... Mon XI, p 63

Winslow (A.), Arkansas coal .... MR 1888, pp 216–224

Wisconsin, altitudes in ...... Bull 5, pp 317–320; Bull 72, pp 197–198, 204–205; Bull 76

Wisconsin; Archean formations of the northwestern states .... Ann 5, pp 175–242

Wisconsin, boundary lines of, and formation of, from territory northwest of Ohio river .... Bull 13, pp 28, 29, 114–116

Wisconsin, brick industry of .... MR 1887, pp 536, 539; MR 1888, p 564

Wisconsin, building stone from, statistics of .... MR 1882, p 451; MR 1887, pp 514, 516; MR 1888, pp 536, 541, 545, 546; MR 1889–90, pp 373, 438–439; MR 1891, pp 461, 463, 464, 468

Wisconsin, cement production of .... MR 1891, p 532

Wisconsin, clay deposits of .... MR 1891, pp 522–523

Wisconsin; copper-bearing rocks of lake Superior, nature, structure, and extent of the .... Ann 3, pp 93–188; Mon V

Wisconsin, Cambrian rocks in, correlation of the .... Bull 81, pp 171–181, 331

Wisconsin, coke in, the manufacture of .... MR 1888, pp 395, 400, 441; MR 1891, pp 361, 366, 401–402

Wisconsin; driftless area of the upper Mississippi valley .... Ann 6, pp 199–322

Wisconsin, fossils from .... Ann 8, II, p 894; Mon XVI, pp 47, 51, 62, 66

Wisconsin, geologic and paleontologic investigations in .... Ann 3, p 19; Ann 5, pp 20, 21, 24–25, 52–53; Ann 6, pp 31, 34–35, 37, 38, 74, 75; Ann 7, pp 71, 83; Ann 8, I, p 143; Ann 9, pp 72, 86; Ann 10, I, pp 125, 129; Ann 11, I, pp 76, 104

Wisconsin, geologic maps of, listed........................Bull 7, pp 89–101, 164–166

Wisconsin, glacial investigations in........................Ann 3, pp 315–322, 381–382, 384–385; Ann 7, p 157

Wisconsin, iron and steel from, statistics of........................Ann 2, p xxviii; MR 1882, pp 120, 125, 129, 130, 131, 133, 135, 136, 137; MR 1883–84, p 252; MR 1885, pp 182, 184, 186; MR 1886, pp 14, 18, 62–73; MR 1887, pp 11, 16, 34–39; MR 1888, pp 14, 17, 23; MR 1889–90, pp 10, 12, 17, 30, 40; MR 1891, pp 54, 55, 61

Wisconsin, lead from, statistics of........................Ann 2, p xxviii; MR 1882, p 312; MR 1883–84, pp 416, 425; MR 1885, p 248; MR 1886, p 148

Wisconsin, lime production of........................MR 1887, p 533; MR 1888, p 556

Wisconsin; limestone from Calumet and Winnebago counties, analyses of........MR 1889–90, p 439

Wisconsin, limestone production of........................MR 1891, pp 464, 468

Wisconsin, manganese deposits in........................MR 1886, pp 188–190; MR 1887, p 151; MR 1888, p 128

Wisconsin, mineral springs of........................Bull 32, pp 151–157; MR 1883–84, p 986; MR 1885, p 541; MR 1886, p 719; MR 1887, p 687; MR 1888, p 629; MR 1889–90, pp 534–535; MR 1891, pp 603, 609

Wisconsin, minerals of, the useful........MR 1882, pp 745–747; MR 1887, pp 806–808

Wisconsin, ocher production of........................MR 1891, p 595

Wisconsin; on secondary enlargements of mineral fragments in certain rocks (mostly from Michigan, Wisconsin, and Minnesota)........................Bull 8

Wisconsin; on the classification of the early Cambrian and pre-Cambrian formations; a brief discussion of principles, illustrated by examples drawn mainly from the lake Superior region........................Ann 7, pp 365–454

Wisconsin, Penokee iron-bearing series of Mich. and..Ann 10, I, pp 341–508; Mon XIX

Wisconsin, residuary clays from, analyses of........................Bull 27, pp 67–68

Wisconsin; rock, ferruginous, from Penokee iron range, analysis of....Bull 42, p 138

Wisconsin, sandstone production of........................MR 1891, pp 461, 463

Wisconsin, topographic work in........................Ann 9, p 57; Ann 10, I, p 94; Ann 11, I, p 38; Ann 12, I, p 29

Wisconsin, zinc deposits and statistics of........................Ann 2, p xxix; MR 1882, pp 366, 367; MR 1886, p 156; MR 1889–90, p 88

Wisconsin and Michigan, rocks from Menominee river, analyses of.....Bull 55, p 81

Witham (Henry T. M.), biographical sketch of........................Ann 5, pp 372–373

Wolff (J. E.), study of the geology of the Crazy mountains of Mont....Ann 11, I, p 55

Wolframite, German, partial analysis of........................MR 1883–84, p 575

Wood, silicified species of, from the Potomac formation............Bull 56, pp 43–52

Wood, fossil, and lignite of the Potomac formation........................Bull 56

Wood rivers, Snake river basin, hydrography of............Ann 11, II, pp 83–85, 106

Woodward (R. S.), administrative report for 1886–87............Ann 8, I, pp 121–124

Woodward (R. S.), administrative report for 1887–88........................Ann 9, pp 68–71

Woodward (R. S.), administrative report for 1888–89............Ann 10, I, pp 106–108

Woodward (R. S.), administrative report for 1889–90............Ann 11, I, pp 128–129

Woodward (R. S.), deformation of the geoid by the removal, through evaporation, of the water of lake Bonneville........................Mon I, pp 421–424

Woodward (R. S.), elevation of the surface of the Bonneville basin by expansion due to change of climate........................Mon I, pp 425–426

Woodward (R. S.), formulas and tables to facilitate the construction and use of maps........................Bull 50

Woodward (R. S.), latitudes and longitudes of certain points in Missouri, Kansas, and New Mexico........................Bull 49

Woodward (R. S.), report on astronomical work of 1889 and 1890............Bull 70

Woodward (R. S.), the form and position of the sea-level........................Bull 48

Worms, earth-, action of, in producing soils....................Ann 12, I, pp 274–276

Wright (G. F.), the glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana, and Illinois..Bull 58

Wyoming, altitudes in.............Bull 5, pp 321–325; Bull 72, pp 196, 225; Bull 76

Wyoming, boundary lines of, and formation of territory..........Bull 13, pp 32, 123

Wyoming, Cambrian rocks of, correlation of the........Bull 81, pp 211–214, 349–351

Wyoming, clay deposits of...MR 1891, p 524

Wyoming, coal area and statistics of...........Ann 2, p xxviii; MR 1882, pp 85–89; 1883–84, pp 12, 100–104; MR 1885, pp 11, 71–73; MR 1886, pp 225, 230, 374–377; MR 1887, pp 169, 171, 380–382; MR 1888, pp 169, 171, 390–394; MR 1889–90, pp 147, 280–286; MR 1891, pp 180, 351–356

Wyoming coals, analyses of.................................MR 1889–90, pp 282, 284

Wyoming, coke industry of................................MR 1891, pp 360, 366, 402

Wyoming, copper from, statistics of.........................MR 1882, pp 216, 229; MR 1883–84, pp 329, 342; MR 1885, p 210; MR 1886, p 112; MR 1887, pp 69, 76; MR 1888, p 54; MR 1889–90, p 60; MR 1891, pp 83–84

Wyoming, Cretaceous rocks of..........................Bull 82, pp 153, 154, 156, 161

Wyoming; Dinocerata, an extinct order of gigantic mammals (remains found in Wyoming)...Ann 5, pp 243–302; Mon x

Wyoming, fossils from.................................Ann 3, pp 420–470; Ann 4, pp 289, 290, 300, 308; Ann 5, p 249; Ann 6, pp 549–556; Ann 8, II, pp 906–908; Bull 29, pp 19, 22; Bull 34, pp 22, 23, 25, 29, 30

Wyoming, geologic and paleontologic investigations in.................Ann 4, p 41; Ann 5, pp 49, 57; Ann 6, p 72; Ann 7, pp 112, 118, 119; Ann 8, I, p 173; Ann 9, p 114; Ann 10, I, p 159; Ann 11, I, pp 101, 123; Ann 12, I, p 119

Wyoming, geologic maps of, listed........................Bull 7, pp 115, 116, 169, 170

Wyoming; geology and physiography of a portion of northwestern Colorado and adjacent parts of Utah and Wyoming....................Ann 9, pp 677–712

Wyoming; glaciers, existing, of the United States................Ann 5, pp 303–355

Wyoming, gold from, statistics of..............Ann 2, p 385; MR 1882, pp 172, 176, 177, 178, 182; MR 1883–84, pp 312, 313; MR 1885, p 201; MR 1886, pp 104, 105; MR 1887, pp 58, 59; MR 1888, pp 36, 37; MR 1889–90, p 49; MR 1891, pp 76, 77

Wyoming, iron and steel from, statistics of.....................MR 1882, pp 120, 125, 133, 135, 136, 137, 147; MR 1883–84, p 285; MR 1885, p 184; MR 1886, p 18; MR 1887, p 11; MR 1888, pp 15, 35

Wyoming, mineral springs of...................................Bull 32, pp 183–184

Wyoming, minerals of, the useful........MR 1882, pp 758–759; MR 1887, pp 808–810

Wyoming, Neocene beds of.......................................Bull 84, pp 309–312

Wyoming, petroleum localities and statistics of.....................MR 1882, p 211; MR 1883–84, pp 217–218; MR 1885, pp 153–154; MR 1888, pp 466–467; MR 1889–90, pp 363–365

Wyoming, salt from, statistics of..........................MR 1882, pp 532–534, 541

Wyoming, sandstone production of.............................MR 1891, pp 461, 463

Wyoming, soda deposits worked in..........Bull 60, pp. 42–46; MR 1885, pp 550–554

Wyoming, tin ore in...........................MR 1883–84, p 613; MR 1885, p 370

Wyoming; types of the Laramie flora (largely from Wyoming)...............Bull 37

Wyoming, Colorado, and Utah, geology and physiography of portions of.....Ann 9, pp 677–712

Wyoming and Gros ventre ranges, Archean and Algonkian literature of the...Bull 86, p 280

Wyoming conglomerate of Wyoming and Utah.......................Bull 84, pp 311, 313

Xanthitane from Green river, Henderson county, North Carolina......Bull 60, p 135

Yale (C. G.), borax...MR 1889–90, pp 494–506

Yale (C. G.), iron on the Pacific coast...MR 1883–84, pp 286–290; MR 1885, pp 196–199

Yale (C. G.), minor minerals of the Pacific coast.................MR 1882, pp 662–663

Yellowstone basin, hydrography of .. Ann 11, II, pp 36–38, 93, 107; Ann 12, II, pp 236–238
Yellowstone lake, altitude, area, discharge, etc., of ....Ann 9, p 93
Yellowstone national park, analyses of waters of the, with an account of the methods of analysis employed ....Bull 47
Yellowstone national park, fayalite from the, analysis of...............Bull 27, p 63
Yellowstone national park; formation of travertine and siliceous sinter by the vegetation of hot springs...Ann 9, pp 613–676
Yellowstone national park, fossils from the ....Ann 8, II, pp 909–910
Yellowstone national park, geologic and paleontologic investigations in the.........................Ann 5, pp 15–18; Ann 6, pp 54–58; Ann 7, pp 87–89; Ann 8, I, pp 149–151; Ann 9, pp 91–94, 128–129; Ann 10, I, pp 23–25, 132–136, 169–170; Ann 11, I, pp 83–85; Ann 12, I, pp 56, 94
Yellowstone national park, geologic maps of the, listed. ....Bull 7, p 169
Yellowstone national park, hot springs and geysers of the.........Ann 9, pp 628–672
Yellowstone national park, Mammoth hot springs, analyses of waters from the ....Ann 9, p 639
Yellowstone national park, Obsidian cliff..........................Ann 7, pp 249–295
Yellowstone national park, reasons for the maintenance of the ......Ann 5, pp 17–18
Yellowstone national park, scorodite from the ....Bull 55, pp 65–66
Yellowstone national park, topographic work in the ....Ann 5, pp 9–10; Ann 6, pp 14–15; Ann 7, p 57; Ann 9, p 60
Yosemite valley, California, origin of the ....Ann 8, I, pp 350–351
Zamieæ of the older Mesozoic of Virginia...........................Mon VI, pp 63–84
Zamieæ of the Potomac or younger Mesozoic.....................Mon XV, pp 166–193
Zeolite, derivation of, from feldspar ....Bull 28, p 52
Zeolites from the basalt of Table mountain, Colorado..............Bull 20, pp 15–38
Zickenite from San Juan county, Colorado ....Bull 20, pp 93–95
Zinc deposits of Missouri, investigation of the.................Ann 11, I, pp 54, 80–81
Zinc, mining and metallurgy of, in the United States...........MR 1882, pp 358–386
Zinc ores, analyses of..MR 1885, pp 337–340
Zinc, statistics of...MR 1882, pp 346–386; MR 1883–84, pp 474–491; MR 1885, pp 272–283; MR 1886, pp 154–159; MR 1887, pp 113–117; MR 1888, pp 92–96; MR 1889–90, pp 88–93; MR 1891, pp 111–116
Zinc sulphide, solubility of.......................................Mon XIII, pp 434, 474
Zinc, the principal foreign producers of ....MR 1882, pp 356–358; MR 1883–84, pp 480–491; MR 1885, pp 276–283; MR 1886, p 159; MR 1888, pp 95–96
Zircon from near Pike's peak, Colorado..........................Bull 20, pp 66–67
Zirconium mineral from Colorado, an ill-defined ....Bull 55, p 52
Zirconium, statistics of....................MR 1883–84, p 661; MR 1885, pp 393–394
Zirkel (F.), report of, on a lithological collection from the Washoe district, Nevada, quoted...Mon III, pp 26–28
Zoisite, a component of metamorphic rocks in the Coast ranges of California..Mon XIII, pp 77–82
Zoisite a product of mineralogical metamorphism......................Bull 62, p 210
Zoisite an evidence of metamorphism..........................Mon XIII, pp 129–130
Zuñi plateau, mount Taylor and the..................................Ann 6, pp 105–198
Zunyite, a new mineral from San Juan county, Colorado ....Bull 20, pp 100–105

A few additional stones have been submitted to me containing what are apparently parts of the wings of cockroaches, but they are too fragmentary to be of the least value. Nothing more can be said than that they are or may be portions of such wings.

It is hoped that the publication of this bulletin will excite further exploration and result in more extended discoveries.

Respectfully yours,

SAMUEL H. SCUDDER.

Hon. J. W. POWELL,
Director U. S. Geological Survey.

INSECT FAUNA OF THE RHODE ISLAND COAL FIELD.

BY SAMUEL HUBBARD SCUDDER.

ARACHNIDA.

ANTHRACOMARTUS Karsch.

ANTHRACOMARTUS WOODRUFFI.

Pl. I, *f*.

Anthracomartus sp. Scudd., Frankl. Soc. Rep. Geol. R. I., 114, Pl. I, Fig. 1 (2 figs.).

A single specimen with its reverse shows the larger part of the abdomen of a species of Anthracomartus distinct from any known, but without any definite margin, though its general form is well indicated as similar to that of *A. trilobitus* Scudd., from Arkansas, but with a relatively broader base. The original relief of the central portion has entirely disappeared by pressure, but it can be seen to have occupied almost exactly the central half, and the whole abdomen, except posteriorly, to have been almost exactly equal in width throughout and strongly rounded behind. Eight segments are shown, and the surface, besides being covered almost uniformly and profusely, but most distinctly in the lateral areas, with rounded or slightly oval slight lenticular elevations of which there are six or eight on either side of each segment, has also lying on the outer edge of the central area a series of larger, slightly more prominent, similar circular bosses, one on either side of each segment, occupying the whole width of the segment. Nothing of this sort appears in any known species of Anthracomartus, and sufficiently distinguishes the present one. The division lines of the segments are gently arcuate on the central area, opening backward, nearly straight, and transverse on the lateral areas.

Length of abdomen, 10^{mm}; breadth, slightly more.

The specimen was found by Rev. Edgar F. Clark, at Pawtucket, and by his request is named for the late Julia M. Woodruff.

NEUROPTEROIDEA.

RHAPHIDIOPSIS, gen. nov.

Known only by its wings, which differ considerably in form, the fore wing being slender, nearly or quite three times as lóng as broad, the apex produced and roundly pointed, the costal margin gently and rather regularly arcuate, the lower margin more strongly and regularly but not greatly arcuate; the hind wing is much broader and less produced, not much more than twice as long as broad, the apex hardly in the least produced and broadly rounded, the costal margin strongly arcuate apically, but very gently before that, the lower margin regularly and strongly arcuate throughout. The neuration is essentially similar in the two wings, though varying a little. The mediastinal and scapular veins are both simple, the former running to beyond the middle of the wing and terminating in the margin, the latter to the apex, and both close together and to the margin throughout their course. The externomedian is the principal vein, occupying with its branches the apical half of the lower margin; a principal superior branch is thrown off well before the middle of the wing, and runs subparallel to but distant from the scapular vein and so has an arcuate course; from it fall two or three inferior distant branches (two in the fore wing, three in the hind) which run parallel to the main stem. The internomedian and anal veins are simple straight divergent veins, which have an apical arcuate or declivent fork, connected at base by straight cross veins with the veins on either side, forming large apical cells much after the manner of Rhaphidia, the further general resemblance to which is heightened by a more or less distinctly and distantly scalariform series of submarginal distant cross veins; other cross veins, straight or faintly sinuous, sometimes transverse, sometimes considerably oblique, are scattered distantly over the wings, giving them a very widely open reticulation of polygonal, triangular, or rhomboidal cells.

This genus is plainly allied most closely to Brongniart's genus Corydaloides, so far known only from the Coal Measures of Europe, but differs from it in the nonfalcate form of the relatively shorter wings, the excessive breadth of the hind wings, and the less numerous and much more distant scapular branches. It evidently belongs to his family Megasecopterida, though I should not place therein all the genera which he refers to it. It can not fall in any of the family groups of Neuropteroidea hitherto recorded from America, nor in any family of insects now extant. It is specially interesting as forming a new link between the Carboniferous insect fauna of Europe and America.

RHAPHIDIOPSIS DIVERSIPENNA.

Pl. I, *c*, *d*.

The wings as preserved show no markings whatever, nor any special structure in the veins, which practically lie at the same level by crushing, though there are signs of difference between the internomedian vein and those on either side of it. In the fore wing there is an intercalary vein connected by oblique cross veins with the externomedian and internomedian veins between which it falls, which does not occur in the hind wing. The cells are all very large and the cross veins mostly straight and transverse, except in the interspace between the scapular vein and the upper externomedian branch, where they are strongly oblique and more or less sinuous.

Length of fragment of fore wing, 22mm; probable length of wing, 26mm; breadth of same, 8.6mm; length of fragment of hind wing, 18mm; probable length of wing, 23mm; breadth of same, 10mm.

The single specimen with its reverse was found by Rev. Edgar F. Clark, June 22, 1888, at the Lockonosett mine, in Cranston, while engaged under Prof. R. Pumpelly in work for the U. S. Geological Survey. The specimens bear the field Nos. 179*a*, 179*b*.

ORTHOPTEROIDEA.

PALÆOBLATTARIÆ.

MYLACRIDÆ.

MYLACRIS Scudder.

MYLACRIS PACKARDII.

Pl. I, *e*, *g*.

Blatta americana Clark, Proc. Newp. Nat. Hist. Soc., II: 12 (undescribed).
Mylacris packardii ——, Rand. Notes Nat. Hist., II: 64 (undescribed); Scudd., Frankl. Soc. Rep. Geol. R. I., 79, Pl. I, Fig. 2.

This species is described first from a single incomplete wing (Pl. I, *e*), preserving only a gently curved fragment of one (the costal) margin and apparently belonging to the genus Mylacris; it differs considerably, however, from all the known species, but most nearly approaches *M. bretonensis.* The wing is of very large size for a Mylacris, being longer than even *M. antiqua* but slenderer than it and is remarkably like *M. heeri* in the narrowness of the mediastinal area, which forms a rather narrow and nearly equal belt, which must extend nearly or quite to the middle of the wing, and has five or six elongated, scarcely diverging nervules, the outer of which spring from near the base of the main stem. The scapular vein is divided at the very base into two stems, and is remarkable for its straightness as well as for its unusual extent, for, notwithstanding the small breadth of the mediastinal area, the scapular vein terminates as usual at or below the apex of the wing; it has seven or eight nearly equidistant branches, with a disproportionate space between the bases of the third and fourth, which may be simple or deeply forked, occasionally with two branches. The externomedian branches are three or four in number, and most of them compound and tolerably regular and longitudinal; in consequence of a break along its inner edge it is impossible to tell how far it extends, and the feeble, moderately distant, forked, and nearly straight branches of the gently arcuate internomedian vein, lying as they do at a lower level, appear to indicate that in deposition the wing was folded at this point. A mere fragment of the anal furrow is preserved, indicating that this area was extremely small and brief, not extending to the middle of the basal half of the wing.

Length of fragment, 40^{mm}; probable length of wing, 42^{mm}; breadth of fragment, 16^{mm}; possible breadth of wing, 18.5^{mm}.

This wing is interesting because it is the first fossil insect found in the New England coal field. It comes from the Carboniferous deposits of Bristol, and was found and sent to me by Rev. Edgar F. Clark. I take pleasure in acceding to his request that I should name it in honor of my life-long friend and fellow student, Prof. A. S. Packard, of Providence, R. I., whose studies in American zoology and paleontology are known to everyone. It is preserved in the Museum of Brown University.

Another specimen of the same species (Pl. I, *g*) differs considerably in the apparent breadth of the mediastinal area, but the outer limit as figured (to which the nervules do not extend) may be not the true margin of the wing. In all other particulars it very closely resembles the other specimen, and, curiously, has the same apparent folding of the wing between the externomedian and internomedian areas. It was found at Pawtucket and seems to be the specimen figured in the Franklin Society's report, although that purports to come from Bristol. It is of the same size.

BLATTINARIÆ.

ETOBLATTINA Scudder.

ETOBLATTINA ILLUSTRIS.

Pl. II, *i*.

This largest of the Rhode Island cockroaches is represented by a fore wing which apparently has the normal form, though the broken nature of the tip renders this somewhat uncertain, the course of the margins preserved tending to show the inner margin nearly straight throughout, the costal well arched so that the wing narrows apically by the recession of the outer margin, the breadth being probably contained about two and a fourth times in the length. The mediastinal area is broad and tapers only in its apical third, the main vein terminating at about the end of the middle fifth of the wing, the branches, some of them deeply forked, being more and more and at last strongly longitudinal. The scapular area appears to extend from the mediastinal to the tip of the wing, and is divided at base into two stems, the upper of which has four widely and equally distinct longitudinal branches, the last arising just beyond the middle of the wing and simple, the first forked opposite the origin of the third, and its forks together with the second and third branches forked nearly opposite the origin of the last; the lower stem has also four superior, subequidistant, longitudinal branches, the first arising opposite the second branch of the upper stem, the fourth opposite the fourth; the second of these is simple, the first forks opposite the origin of the second and its lower fork again divides opposite the single fork of the third, which on its part is midway between the origin and fork of the fourth; there may, of course, be other forks in the part of the wing which is here broken, but if so they are probably not far from the margin. The externomedian vein is very unimportant; it first forks a little before the middle of the wing, its lower branch again forking less than halfway to the tip, but all three diverge but little and must occupy but a narrow space on the margin. The internomedian area, on the contrary, is more important, narrowing rather gradually in the basal half of the wing, very gradually beyond the main vein, terminating not very far before the tip of the wing, and having about half a dozen generally forked or doubly forked, divergent, nearly straight branches dividing the area with great regularity. The anal furrow is rather strongly bent and a little arcuate, and terminates before the end of the basal third of the wing, the anal veins apparently parallel to the furrow.

Length of fragment, 46.5^{mm}; probable length of wing, 61^{mm}; breadth, 26.8^{mm}.

This species seems to show a number of points of resemblance to the European *E. primæva* Gold. sp., but differs from it strikingly in the basal division of the scapular vein. It also resembles not a little the European *E. steinbachensis* Kliver, but has quite another form and differs in every detail.

The specimen was found by Mr. J. E. Clark, but at what exact locality is unknown. It is presumed by Mr. H. Scholfield, through whom it came to my hands, to have come from Pawtucket.

ETOBLATTINA sp.

Pl. II, *c*.

This species, certainly distinct from any of the other Rhode Island forms, but too imperfect for anything like a full description of the wing, is represented by a fragment from the middle of the fore wing; only a very small part of the natural border exists, lying outside the mediastinal area. It is evidently one of the broader types. The mediastinal area is narrow and rather short, with numerous short, straight, oblique branches. The scapular vein terminates some distance before the tip, and has three equidistant, gently arcuate, upturned branches, the outer two simple, the inner doubly forked. The remainder of the fragment is filled with a multitude of slightly diverging, mostly simple, occasionally forked, straight, longitudinal nervules, the division of which among the lower stems there are no means of determining.

Length of fragment, 10^{mm}; breadth, 7.5^{mm}.

The species would seem to fall somewhere in the vicinity of *E. primæva* Gold. sp. It was obtained by Mr. Herbert Scholfield at Silver Spring, East Providence.

ETOBLATTINA CLARKII.

Pl. II, *j*.

The fore wing has the normal form, the inner border being straight to near the tip, the outer delicately-margined border pretty strongly and regularly convex, so that the wing tapers rather rapidly in the outer half to the rounded tip at the end of the inner half of the wing; it is broadest just before the middle and about two and three-eighths times longer than broad. The mediastinal area is very large and long, extending nearly to the apical fourth of the wing and beyond the basal third narrowing very gently, acuminate at apex; there are seven or eight mostly forked, gently sinuate, increasingly longitudinal, oblique branches. The scapular area reaches nearly to the apex and has unusually longitudinal branches; there are three branches, all inferior and arising at great distances apart, the first near the base, the third a little beyond the middle of the wing; all are forked, the first and second near the origin of the third. The externomedian vein is strongly sinuate and has four superior equidistant branches almost confined to the second fourth of the wing, the third and fourth simple, the second simply the first doubly forked, the apical forking being near the middle of the apical half of the wing. The main internomedian vein is similarly sinuate and terminates considerably farther out than the mediastinal; it has three subequidistant, forked or doubly forked, strongly arcuate, sweeping basal branches, besides a simple (?), nearly longitudinal apical branch a little beyond the middle of the wing. Anal furrow strongly bent and arcuate, well within the basal third of the wing, the anal veins few, distant, simple or singly forked, and subparallel to it. The apical half of the wing shows a very close and delicate cross venation between the nervules, breaking the surface up into quadrangular cells several times broader than long.

Length of fragment, 41^{mm}; probable length of wing, 45^{mm}; breadth, 19^{mm}.

This species somewhat resembles the European *E. russoma* Gold. sp. and also *E. mazona* Scudd., from Illinois, but the greater longitudinality and basal extension of the scapular branches and the rapid basal narrowing of the internomedian area by the strong sinuation of the main internomedian vein easily distinguish it. These are, indeed, its marked features in contradistinction from all known forms.

The single specimen with its reverse was discovered by Rev. Edgar F. Clark at Pawtucket. It is now in the Museum of Brown University. I take pleasure in naming it after Mr. Clark, who was the first to discover insect remains in the Rhode Island coal field.

ETOBLATTINA SCHOLFIELDI.

Pl. II, *b*.

So much of both the apex and base of the single fore wing preserved is lost that the form of the wing can not be determined, but the costal margin was very gently arcuate, and the probability is that the wing had rather an oval form and was not much more than twice as long as broad. The mediastinal area is broad and equal in the basal, regularly narrowing in the apical half, reaching to less than the extremity of the middle third of the wing, with nearly straight, strongly oblique, simple branches. The scapular vein nearly reaches the apex, repeats the general appearance of the mediastinal, but with closer and more subdivided branches, most of them being compound; it begins to branch at the end of the basal third of the wing, and has in all about five branches, the earlier ones the more compound. The externomedian vein courses in a nearly straight line through the middle of the wing, and begins to branch as soon as the scapular, but its branches, though compound, are distantly so and diverge but little, so that they only occupy on the margin the very apex of the wing; their forkings are subparallel and subequidistant. The internomedian area is broad, and, though the main vein is a little sinuous, the area narrows pretty regularly and gradually, reaching about as near the apex as the scapular area; there are seven subequidistant, nearly straight, oblique, simple, or compound branches, the last just beyond the middle of the wing, besides one simple one considerably farther out. The anal furrow is not pronounced and is gently arcuate, terminating at the end of the basal third of the wing.

Length of fragment, 14^{mm}; probable length of wing, 18^{mm}; breadth, 9^{mm}.

There are many points of resemblance between this species and the European *E. labachensis* Gold. sp., but the far earlier and more profuse branching of both scapular and externomedian veins separates our species distinctly from it.

This specimen was obtained at East Providence by Mr. Herbert Scholfield, to whom it is dedicated.

ETOBLATTINA sp.

Pl. II, *k*.

A single hind wing of a cockroach has been found in the Rhode Island beds, nearly perfect, the tip and an insignificant part of the base only being lost. The wing expands in size to the middle of the apical half and then begins rapidly to narrow, and probably had a rounded, perhaps angulated tip. The narrow scapular area is nearly uniform in breadth, tapering only next the apex, which is at the end of the middle third of the wing; there are three or four simple oblique apical branches. The scapular vein has four branches arising in the basal half of the wing, the first one near the base, all deeply forked and slightly divergent, but not expanding the area at the tip of the wing. The externomedian occupies just about as large a fan-shaped area, and shows a somewhat similar disposition of its branches, but does not begin to branch quite so early and the branches are more longitudinal. The internomedian is a reverse of the scapular if its basal branch be omitted. The anal is widely separated from the preceding, and differs in toto from the same in the fore wings of Palæoblattariæ, being a more basal reversed repetition of the mediastinal vein; it extends nearly to the middle of the wing and has two or three distant, straight, oblique branches.

Length of fragment, 15^{mm}; probable length of wing, 18^{mm}; breadth, 8^{mm}.

A comparison with the fore wings of the other cockroaches from the same deposit makes it very probable that this is the hind wing of *E. scholfieldi*, but until they are found together this can not be determined.

The single specimen and its reverse were found by Messrs. Frederick P. Gorham and Herbert Scholfield at Fenner's ledge, in Cranston, "near the extreme western upturned edge of the Carboniferous in the plumbago mining district, and therefore probably older than the others."

ETOBLATTINA GORHAMI.

Pl. II, *a*.

The fore wing is apparently of a very regular oval shape, slenderer apically than toward the base, broadest at about the end of the basal third, and scarcely two and a half times longer than broad. The mediastinal area is ribbon-shaped, tapering only at the apex, reaching to the end of the middle third of the wing, the veins simple and arcuate. The scapular area is broad and reaches almost to the apex of the wing, and is filled with numerous regular, parallel, and arcuate, deeply-forked veins. The main externomedian vein runs almost straight through the middle of the wing with a slight sinuation, has two longitudinally oblique branches in the second fourth of the wing, simple so far as visible, but the apical half of the wing in this area is lost. The internomedian area appears to extend slightly farther than the mediastinal, and the main vein is sinuate and declivent, with, so far as can be seen, three simple parallel, oblique, and slightly arcuate branches, their convexity, when any, toward the anal area. The anal furrow is distinctly impressed, arcuate, and slightly bent, terminating a little before the middle of the wing; the anal veins are mostly simple, one medially forked, few in number, and subparallel to the furrow.

Length of fragment, 17.5^{mm}; probable length of wing, 21.5^{mm}; breadth, 9^{mm}.

This species seems to resemble the European *E. parvula* Gold. sp. more than any other, but differs from it considerably.

A single specimen was collected at Pawtucket, by Mr. Frederick P. Gorham, after whom it is named. It was sent to me by Dr. Packard.

ETOBLATTINA EXILIS.

Pl. II, *e*.

This is an exceptionally slender species, resembling in that respect the following species from the same beds, the fore wing being very elongate subfusiform oval, almost three times longer than broad; the costal margin is very regularly and not inconsiderably arcuate. The mediastinal area broadens a little beyond the base, and narrows again and rather rapidly only in its apical fifth, terminating a little beyond the end of the middle third of the wing; the branches are few, longitudinally oblique, straight, and simple. The scapular area reaches almost to the tip of the wing; the main vein begins to branch before the middle of the wing, and has four simple or deeply forked gently arcuate branches closely crowded together. The externomedian vein occupies the entire apex; it begins to branch as soon as the scapular and its branches are longitudinal and compound, and is but slightly divergent, a half dozen or more veinlets striking the margin. The internomedian area reaches beyond the middle of the apical half of the wing and is peculiar for its nearly uniform width, which is about the same as that of the mediastinal area, and for the few and distant, mostly compound, very longitudinally oblique, and straight branches. The anal area is extraordinarily narrow, the furrow slight and almost longitudinal, hardly arcuate, and terminating before the end of the basal fourth of the wing.

Length, 14.25^{mm}; breadth, 4.6^{mm}.

This species shows most resemblance to the European *E. flabellata* Germ. sp., and especially the form described by Deichmüller as var. *stelzneri*, but differs in the complete longitudinality of the externomedian branches, and the lack of any sinuosity in the internomedian vein.

It was obtained by Mr. Herbert Scholfield in a bowlder lying on the beach, near Kettle Point, in East Providence.

ETOBLATTINA sp.

Pl. II, *k*.

A single hind wing of a cockroach has bee iat
Island beds, nearly perfect, the tip and an ins it
only being lost. The wing expands in size ng
half and then begins rapidly to narrow er-
perhaps angulated tip. The narrow s he
breadth, tapering only next the ap ly
dle third of the wing; there are p-
branches. The scapular vein h ese
half of the wing, the first on iddle of
slightly divergent, but not the interno-
The externomedian occupie *exilis*, reaching
shows a somewhat simil of the vein appear to
begin to branch quite s area tapering considerably.
The internomedian is *E. exilis*.
omitted. The anal ole length of wing, 18.5^{mm}; breadth,
in toto from the sa
basal reversed re obtained by Mr. Herbert Scholfield, at Paw-
the middle of th
branches.

Length of
8^{mm}.

ETOBLATTINA RELIQUA.

Pl. II, *g*.

A comp
same der wing is very regularly long-oval and slender, being fully
scholfie es as long as broad. The mediastinal area is just two-thirds
The gth of the wing and very slender, tapering very regularly and
P. the veins simple and oblique. The scapular vein is very pecu-
"r for an Etoblattina; the main stem is nearly straight, and runs par-
F and near to the mediastinal, terminating, after sending out close
the tip a couple of short superior branches, about half way between
the tip of the mediastinal and the apex of the wing; but at about the middle of the wing it sends off an important inferior branch which runs longitudinally to the apex, and from its upper surface emits one quarter way to the tip a medially forked branch. The externomedian vein is also very peculiar, for it is so closely united throughout its basal fourth with the scapular as scarcely to be distinguished from it, and then parts from it at the same angle as the inferior branch of the same and is simple except for a short apical fork. The internomedian vein is not completely preserved, but by the limitations of the externomedian extends nearly to the tip of the wing and appears to be nearly longitudinal with very long, longitudinal, and infrequent offshoots. The anal vein is not deeply impressed, moderately arcuate, and apparently terminates at the end of the basal third of the wing.

Length, 20.5^{mm}; probable breadth, 6.75^{mm}.

ETOBLATTINA sp.

Pl. II, *h*.

This species is represented by a single very obscure and somewhat imperfect fore wing, which hardly permits more than to say that it differs from any known form, but closely resembles the preceding species, *E. exilis*. It is, however, somewhat slenderer, but with otherwise a similar form, the breadth being contained about 2.8 times in the length. The mediastinal area is apparently shorter and relatively broader than in *E. exilis*, and the scapular area does not so closely approach the apex. The externomedian vein has few branches, and these are very longitudinal, the main vein coursing through the middle of the wing, but apically passing above the extreme apex. The internomedian vein evidently extends further out than in *E. exilis*, reaching the middle of the apical half, and a few branches of the vein appear to be simple and rather strongly arcuate, the area tapering considerably. The anal furrow seems to be quite as in *E. exilis*.

Length of fragment, 17^{mm}; probable length of wing, 18.5^{mm}; breadth, 6.5^{mm}.

A single specimen was obtained by Mr. Herbert Scholfield, at Pawtucket.

ETOBLATTINA RELIQUA.

Pl. II, *g*.

The fore wing is very regularly long-oval and slender, being fully three times as long as broad. The mediastinal area is just two-thirds the length of the wing and very slender, tapering very regularly and gently, the veins simple and oblique. The scapular vein is very peculiar for an Etoblattina; the main stem is nearly straight, and runs parallel and near to the mediastinal, terminating, after sending out close to the tip a couple of short superior branches, about half way between the tip of the mediastinal and the apex of the wing; but at about the middle of the wing it sends off an important inferior branch which runs longitudinally to the apex, and from its upper surface emits one quarter way to the tip a medially forked branch. The externomedian vein is also very peculiar, for it is so closely united throughout its basal fourth with the scapular as scarcely to be distinguished from it, and then parts from it at the same angle as the inferior branch of the same and is simple except for a short apical fork, The internomedian vein is not completely preserved, but by the limitations of the externomedian extends nearly to the tip of the wing and appears to be nearly longitudinal with very long, longitudinal, and infrequent offshoots. The anal vein is not deeply impressed, moderately arcuate, and apparently terminates at the end of the basal third of the wing.

Length, 20.5^{mm}; probable breadth, 6.75^{mm}.

This is a very anomalous form of Etoblattina. It was collected by Mr. Frederick P. Gorham at Pawtucket, and sent to me for study by Prof. A. S. Packard.

GERABLATTINA Scudder.

GERABLATTINA SCAPULARIS.

Pl. II, *l*.

The larger part of a fore wing, showing all the principal neuration, but with the tip lost, is all that remains of this species. It appears to be of a pretty regular long oval form with the costal margin strongly arched at the base but very gently beyond, probably fully two and a half times longer than broad. The mediastinal area is rather broad and tapers very gently, reaching well beyond the middle of the apical half of the wing; the nervules are simple or singly and rather deeply forked, one near the middle trebly forked, and all longitudinally oblique and gently arcuate. The scapular vein is longitudinally branched, beginning at the middle of the basal half of the wing, its lowermost fork striking the tip of the wing; the forks are rather distant and about seven nervules reach the margin. The externomedian vein is strongly sinuous, superiorly branched with three forked or doubly and very deeply forked longitudinal slightly arcuate nervules, the first arising nearly as far back as in the scapular area. The internomedian area terminates just beyond the middle of the wing, sending a few simple, obliquely, and gently arcuate branches from the strongly sinuate main stem. The anal region is not preserved.

Length of fragment, 33.5^{mm}; probable length of wing, 41^{mm}; breadth of fragment, 14.5^{mm}; probable breadth of wing, 16^{mm}.

This species differs from all previously known, and resembles the other species from the same coal field in the early branching of the scapular and the relative brevity of the internomedian vein.

It was obtained by Mr. Herbert Scholfield, at Pawtucket.

GERABLATTINA FRATERNA.

Pl. II, *d*, *e*.

The form and proportions of the fore wing are much as in *G. scapularis*, but it tapers rather more in the apical half and is a little slenderer, besides being much smaller; it is about two and two-thirds times longer than broad, the costal margin rather gently arcuate and not greatly more so next the base, the inner nearly straight. The mediastinal area is moderately broad and equal, except apically, and reaches well beyond the middle of the apical half of the wing; the nervules are arcuate and either single or singly and deeply forked, one near the middle doubly forked. The scapular includes on the margin almost the whole of the tip of the wing, and is composed of two main stems which separate near the middle of the basal half of the wing, the lower the more important, with many deeply forked, very longitudinally arcuate, superior, much upcurved nervules of which more than ten strike the margin. The externomedian vein is rather strongly sinuate with two superior branches thrown off before the middle of the wing, the first simple, the second very deeply forked, all nearly longitudinal. The internomedian vein is gently sinuate and reaches nearly to the middle of the apical half of the wing, with somewhat differently directed inequidistant, mostly simple branches, the basal doubly forked and occupying nearly half the area. The anal furrow is rather gently and regularly arcuate and terminates at about the end of the basal third of the wing. The surface is traversed between the nervules by tremulous delicate close cross lines, and in part by a delicate reticulation (*d*).

Length of fragment, 15^{mm}; probable length of wing, 18^{mm}; breadth, 6.75^{mm}.

This species resembles only the preceding of all the known species of Gerablattina, but besides much being smaller, it has a much stronger upcurving of the apical scapular branches and a less important development of the externomedian area, made up for by the greater extension of the internomedian.

It was found by Mr. Herbert Scholfield at Silver Spring, East Providence.

PROTOPHASMIDA.

PARALOGUS (παράλογος) gen. nov.

Fore wings long and slender, a little more than three times as long as broad, the costal margin nearly straight, the hinder margin rather strongly arcuate, much the broadest in the middle. Mediastinal vein simple, running very close to the margin in the outer half of the wing, and probably terminating about its middle; the marginal area relatively broad in the middle of the basal half by the convexity of the margin in this region. Scapular vein throughout its course parallel to and not distant from first the mediastinal vein and then the margin, emitting its only inferior offshoot before the middle of its basal half; this almost immediately divides, its upper branch with a few longitudinal offshoots reaching the margin probably above the apex, the other with many arcuate sublongitudinal offshoots in the apical half of the wing falling below the apex. The strongly sinuate externomedian vein is simple, and strikes the hinder margin a little beyond the middle of the apical half of the wing. The internomedian and anal veins originate from a single stem, part from each other a little nearer the base than the scapular division, and each sends numerous equidistant arcuate branches to the margin, the anal area extending beyond the middle of the wing. The reticulation is almost exclusively quadrangular by straight transverse cross veins, and there are very few intercalaries, and these brief.

The most remarkable thing about the neuration of this wing is the simplicity of the externomedian vein which runs in a sinuous course through the middle of the wing between the numerous branches of the adjoining veins. The wing evidently belongs to one of the Protophasmida, but does not at all agree with any of the genera known to me from American rocks, though it shows some strong resemblance to the European Spilaptera Brongn., known only through an illustration which does not permit one to see the details of the neuration except along the lower margin of the wing. It is plain, however, that the internomedian and anal areas occupy a considerably broader basal area in Spilaptera than in Paralogus and the externomedian vein is apparently branched.

PARALOGUS ÆSCHNOIDES.

Pl. I, *a*, *b*.

The fore wing has much the same general form as that of a dragon fly of the genus Æschna. In the marginal field of the basal half of the wing, the middle portion of the interspace between the scapular vein and its branch and in the interspaces bordering either side of the externomedian vein in more than the basal half of the wing, the cells are higher than long; in nearly all the rest of the wing they are quadrate or approximately so. The united internomedian and anal vein has in the basal third of the wing a sinuous course nearly parallel to that of the externomedian vein and breaks up into three principal stems, two of which divide the anal area about equally between them with pretty regular branches, those of the extreme base not united by cross veins, those of the distal portion of the proximal anal stem usually forked next the margin, those of the distal anal stem similar but the alternate branches more or less zigzag and as if intercalary, uniting indirectly with the stem, their apical forks attached also to the neighboring stem, forming brief intercalaries; the externomedian stem first forks a little before the middle of the wing, then divides into three branches, the proximal simply forked, the middle throwing off one or two superior compound branches, the distal many simple inferior branches.

Length of fragment, 54^{mm}; probable length of wing, 62^{mm}; width in middle of wing, 19^{mm}; at base of fragment, 5^{mm}.

The specimen and its reverse were found by Mr. Frederick P. Gorham, November 2, 1889, in the Carboniferous rocks of Silver Spring, in East Providence.

PLATE I.

EXPLANATION OF PLATE I.

All the drawings are by J. Henry Blake, and, excepting *f*, are magnified 2 diameters.

a. Paralogus æschnoides; the dotted tip is purely conjectural.

b. The same; cross section at the point indicated by the arrow: *m*, mediastinal vein; s^1, s^2, s^3, scapular vein and branches; *e*, externomedian vein; i^1, i^2, internomedian vein and branch; *a*, anal vein.

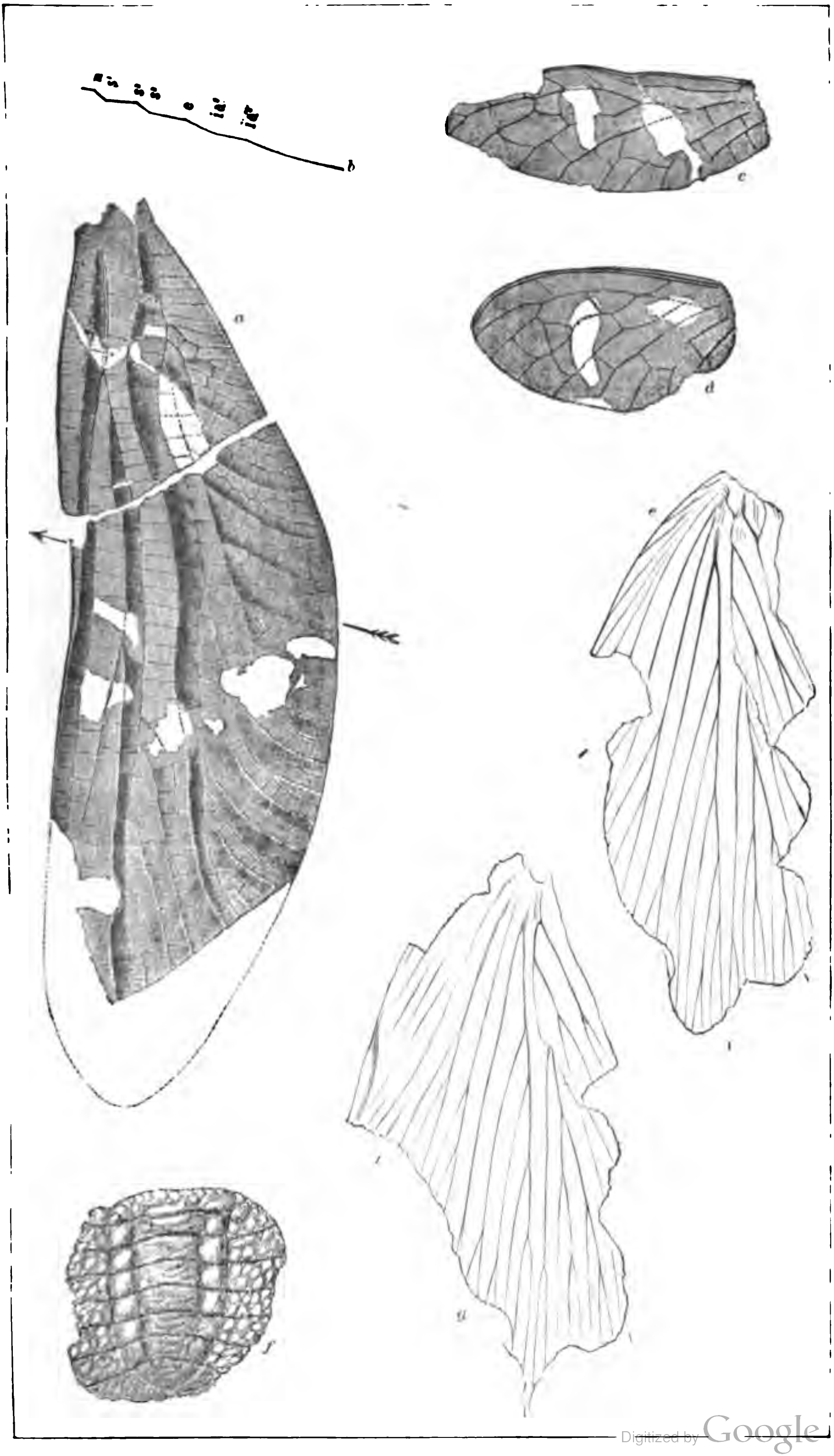
c. Rhaphidiopsis diversipenna; upper wing.

d. The same; lower wing.

e. Mylacris packardii, from Bristol.

f. Anthracomartus woodruffi; magnified 3 diameters.

g. Mylacris packardii, from Pawtucket.



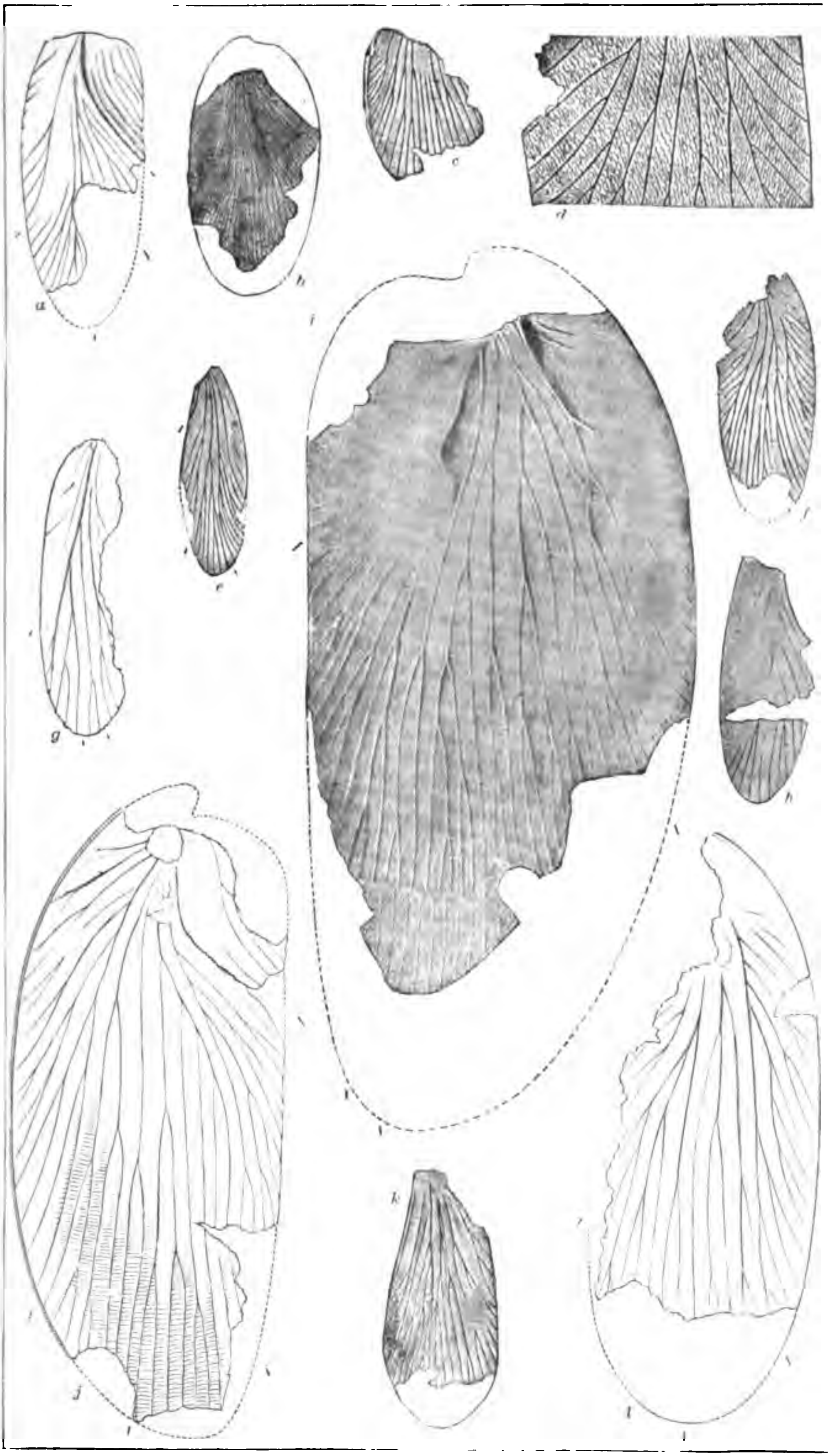
ARACHNIDA, NEUROPTEROIDEA, MYLACRIDÆ, AND PROTOPHASMIDA OF THE CARBONIFEROUS BEDS OF RHODE ISLAND.

PLATE II.

EXPLANATION OF PLATE II.

All the drawings are by J. Henry Blake, and, excepting *d*, are magnified 2 diameters.

a. Etoblattina gorhami; fore wing; the dotted tip conjectural.
b. Etoblattina scholfieldi; fore wing; the dotted tip conjectural.
c. Etoblattina sp.; fore wing.
d. Gerablattina fraterna; a part of the surface, magnified about 5 diameters
e. Etoblattina exilis; fore wing.
f. Gerablattina fraterna; fore wing; the dotted tip conjectural.
g. Etoblattina reliqua; fore wing.
h. Etoblattina sp.; fore wing.
i. Etoblattina illustris; fore wing; the dotted base and tip conjectural.
j. Etoblattina clarkii; fore wing; the dotted base and tip conjectural.
k. Etoblattina sp.; hind wing; the dotted tip conjectural.
l. Gerablattina scapularis; fore wing; the dotted tip conjectural.



BLATTINARIÆ OF THE CARBONIFEROUS BEDS OF RHODE ISLAND.

LETTERS OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
WASHINGTON, D. C., *June* 15, 1892.

SIR: I have the honor to transmit herewith the manuscript of a Catalogue and Bibliography of North American Mesozoic Invertebrates, which has been prepared by Dr. C. B. Boyle, of this division, in accordance with the plan approved by you at the time it was undertaken.

Very respectfully,

C. A. WHITE,
Geologist in Charge.

HON. J. W. POWELL,
Director U. S. Geological Survey.

U. S. GEOLOGICAL SURVEY,
DIVISION OF MESOZOIC INVERTEBRATE PALEONTOLOGY,
WASHINGTON, D. C., *June* 15, 1892.

SIR: I herewith transmit to you the MS. of a bibliography and catalogue of the known North American Mesozoic invertebrates, upon the preparation of which I have been engaged, together with other pressing work, for the past several years. I have encountered the usual difficulties that attend a work of this kind, and am quite prepared for the discovery of errors by those who are familiar with the subject and who shall examine this work. Mr. T. W. Stanton, of the Survey, has been of the greatest assistance to me, especially as regards foreign publications, and to you, sir, I am largely indebted for whatever of value the work may possess.

Very respectfully,

C. B. BOYLE.

DR. C. A. WHITE,
Chief of Division.

PREFACE.

This work is divided into two parts, Part I being devoted to bibliography and Part II to a catalogue of species and genera.

Part I is intended to embrace a notice of every work, wherever published, that contains the systematic publication of any invertebrate species which has by any author been referred to the Mesozoic. All works containing only lists or mere mention of species by name are omitted, but those containing names accompanied by figures, even if without descriptions, are included.

In the case of serial publications both the title page date and the date of actual issue are given if the latter is known. In other cases the title page date is given as the true date of issue, even though within the compiler's personal knowledge it is wrong.

Some difficulty has arisen from the fact that in some of the earlier publications of species authors have referred certain formations to the Tertiary that are now assigned to the Cretaceous; and it is possible that some of these publications have been omitted from the list, but the republication of the same species as Cretaceous will appear in the proper place.

Part II consists of a catalogue of all the names that have been applied to the genera and species of invertebrates obtained from North American rocks and referred by any author to the Mesozoic. The arrangement is alphabetical and chronological. The entries contain the generic and specific names as they have been used by authors, no attempt having been made to correct erroneous spelling.

The specific name is repeated in each entry which is required by every separate publication of the species, but a separate entry for the generic and subgeneric name is not repeated. Names of groups higher than genera are omitted.

The localities mentioned are in all cases those given by the respective authors. Because of subsequent changes in state and territorial boundaries the reader may find difficulty in recognizing them. In such cases he is referred to Bulletin 13 of the U. S. Geological Survey, in which the successive changes of those boundaries are recorded.

In referring species to their respective formations the subdivisions mentioned by certain authors are not given. This omission is thought to be necessary because of the great number of local names that have been applied at different times, many of which have become obsolete. This is especially the case with the Cretaceous formations. In some cases the reference of species by authors to the Cretaceous is changed to Tertiary and in others from Tertiary to Cretaceous. In doing this the author has followed to a great extent the correlation of Dr. C. A. White, as published in Bulletin U. S. Geological Survey, No. 82, Washington, 1891. As in that work, the Laramie is provisionally included in the Cretaceous, together with certain other formations that are regarded as transitional.

PART I.

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Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 215–217. Berlin, 1870.

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—— Descriptions of one new Cretaceous, and seven new Eocene fossils.

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—— Descriptions of new fossil shells of the United States.

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Part 3. Cretaceous fossils from Vancouver island region, pp. 35–48.

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Part 5. Mesozoic mollusca from the southern coast of the Alaskan peninsula, pp. 64–70.

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PART II.

LIST OF FOSSILS.

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Rep. U. S. Geol. Sur. Terr., vol. 9, p. 78. Wash., 1876. F. B. Meek.

Acella (sub. gen. Hald.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 533. Wash., 1876. F. B. Meek.

—— (Haldeman) White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 714. Wash., 1878. C. A. White.

—— haldemani n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 714. Wash., 1878. C. A. White.

Formation: Cretaceous.

Location: Valley of Bear river, near its confluence with Sulphur creek, Wyoming.

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Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Near Mellis station, Wyoming.

—— haldemani White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 84, pl. 30, figs. 9*a*, *b*. Wash., 1883. C. A. White.

Formation: Cretaceous.

—— sp. undet. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, p. 18. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: North or second branch of the Milk river, Canada.

Acervicolausa n. g. G. & H. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858–1860, p. 403. Phila., 1858–1860. Gabb & Horn.

—— vermicularis n. s. G. & H. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858–1860, p. 403, pl. 69, figs. 42–44. Phila., 1858–1860. Gabb & Horn.

Formation: Cretaceous.

Location: Near Mullica hill, New Jersey.

Acila (sub. gen. H. & A. Ad.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 98. Wash., 1876. F. B. Meek.

Acmæa (Esch.) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2. Phila., 1869. W. M. Gabb.

Acmæa—Continued.

—— occidentalis (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 295–296, pl. 18, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Cheyenne river, near the Black hills.

——? papillata (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 296–297, pl. 31, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Fox hills, Dakota.

——? parva (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 296, pl. 18, figs. 1*a–c*, and fig. 2. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: On either the Yellowstone or the Cheyenne river.

—— ? tejonensis n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 172–173, pl. 28, fig. 56. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Tejon, Cal.

—— sp. undet. Whiteaves. (1879.)

Geol. Sur. Can.; Mes. Foss. vol. 1, pt. 2, pp. 130–131, pl. 16, figs. 6, 6*a*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nanaimo river, two miles and a quarter up, Vancouver island.

Acrochordiceras n. g. Hyatt. (1877.)

Rep. Geol. Expl. 40th Parallel, vol. 4, pt. 1, p. 124. Wash., 1877. Alpheus Hyatt.

—— (?) carlottense n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 2, pp. 141–142, pl. 19, fig. 1. Montreal, 1889. J. F. Whiteaves.

Formation: Triassic.

Location: Houston Stewart channel, Q. C. I.

—— hyatti n. s. Meek. (1877.)

Rep. Geol. Expl. 40th Parallel, vol. 4, pt .1, pp. 124–126, pl. 11, figs. 5, 5*a*. Wash., 1877. F. B. Meek.

Formation : Triassic.

Location : New Pass, Desatoya mountains, Nevada.

Acroloxus (Beck) Meek. (1876.)

Rep. U. S. Geol. Sur., Terr., vol. 9., p, 543 Wash., 1876. F. B. Meek.

Acroloxus—Continued.

—— **minutus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 543–544, pl. 40, fig. 10. Wash., 1876. F. B. Meek.
Formation: Probably lower Eocene (Cretaceous).
Location: Three miles below Fort Union.

—— **minutus** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 83. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Fort Union, in the upper Missouri river region.

—— **minutus** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 45, pl. 24, fig. 27. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Fort Union.

—— **minutus** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, p. 17. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: North or Second branch of the Milk river; Gooseberry canyon, St. Mary river, and Old Man river, two miles above Rye Grass flat; Pincher creek, Canada.

—— **radiatulus** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, p. 17, pl. 3, figs. 1, 1a. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Mouth of Blind Man river, township 39, range 27; west of 4th principal meridian, Canada.

Acrosmilia (sub. gen. d'Orb.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 207. Phila., 1864. W. M. Gabb.

Actæon (Mont.) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 207. Phila., 1858–1860. T. A. Conrad.

—— **attenuatus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 281–282, pl. 19, figs. 17, *a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, 150 miles from its mouth.

—— **attenuatus** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur., Can.; Cont. Can. Paleont., vol. 1, pt. 1, p. 46. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Old Wives creek, township 10, range 11 west of 3d principal meridian, Canada.

—— **concinnus** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 390, pl. 3, figs. *4a–d*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek; Great Bend of the Missouri.

Actæon—Continued.

—— **cretacea** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 318–319. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, New Jersey.

—— **impressus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 142–143, pl. 21, fig. 106. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Cal.

—— **inornatus** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, pp. 15–16, pl. 4, figs. 16–18. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Pence's ranch, Butte county, Cal.

—— **intercalaris** n. s. Meek. (1876.)
Rep. Expl. Exped. Santa Fé, New Mexico, to junction of Grand and Green rivers, Macomb, p. 129, pl. 2, figs. 4*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Rio de la Plata.

—— **modicellus** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 287. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— **ovoidea** n. s. Gabb. (1861)
Proc. Acad. Nat. Sci., Phila. for 1861, p. 319. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, New Jersey.

—— **subellipticus** n. s. M. & H. (1876.)
Proc. Acad. Nat. Sci., Phila. for 1856, pp. 63–64. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Crow creek, near Black Hills, Nebraska.

—— **subellipticus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 280–281, pl. 19, fig. 16. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Crow creek, near the Black hills, Dakota.

—— **woosteri** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of Saint Vrains creek, Colorado.

—— **woosteri** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 225. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near White river Indian Agency, Colorado.

—— **woosteri** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 304, pl. 7, figs. 9*a*, *c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near the confluence of the Saint Vrains and South Platte rivers, northern Colorado. Also, from Rio San Juan, southwestern Colorado.

Actæon—Continued.

—— **sp. undet.** Whiteaves. (1876.)
Geol. Sur. Can.; Mes. Foss. vol. 1, pt. 1, p. 53. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

Actæonella (d'Orb.) Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 173. Phila., 1869. W. M. Gabb.

—— **dolium** n. s. Roemer. (1849.)
Texas, p. 411. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Texas.

—— **dolium** Roemer. (1852.)
Die Kreide von Texas, p. 43, Taf. 4, fig. 4. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Texas.

—— **oviformis** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 173, pl. 28, fig. 58. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

Actæonina (D'Orb.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858-1860, p. 299. Phila., 1858-1860. Wm. M. Gabb.

—— **biplicata** (M. & H. sp.) Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila. for 1860, p. 93, pl. 2, fig. 13. Wm. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, New Jersey.
(= Actæon biplicata M. & H.)

—— **californica** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 114, pl. 19, fig. 68. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Northeast of Martinez; two miles north of Benicia; eight miles north of Yreka, Cal.

—— **naticoides** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 299, pl. 48, fig. 2. Phila., 1858-1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, and Mullica Hill, New Jersey.

—— **prosocheila** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of Saint Vrains creek, Colorado.

—— **prosocheila** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 305, pl. 7, figs. 10*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Confluence of the Saint Vrains and South Platte rivers, northern Colorado.

—— ? **pupoides** n. s. Gabb. 1864.
Geol. Sur. Cal., Paleont., vol. 1, pp. 113-114, pl. 19, fig. 67. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Shasta county, Cal.

Actæonina—Continued.

—— **pupoides** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 173, pl. 28, fig. 57. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Cal.

—— (?) **sp. undet.** Whiteaves. (1874.)
Geol. Sur. Canada; Rep. Prog. for 1873-74, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-half and two and one-fourth miles up.

—— **sp. undet.** (1876.)
Geol. Surv. Can.; Mes. Foss. vol. 1, pt. 1, p. 53. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

Acteon(Solidula)attennuta n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila. for 1858, p. 54. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river

Actinoceramus n. sub. gen. Meek. (1864.)
Check list Invert. Foss. N. Am. Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 32. Wash., 1864. F. B. Meek.

Actinophorus n. sub. gen. Meek. (1864.)
Am. Jour. Sci., 2d. ser., vol. 37, p. 218. New Haven, 1864. F. B. Meek.

Admete (Möller) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, p. 198. Wash., 1875. C. A. White.

—— ? **gregaria** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 501-502. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? **rhomboides** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 501. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? **subfusiformis** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 502. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Admetopsis) gregaria** (Meek) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, pp. 198-199, pl. 18, figs. 5*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: North fork of Virgin river, Utah.

Admetopsis (sub. gen. Meek) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, p. 198. Wash., 1875. C. A. White.

Admetopsis—Continued.

—— **gregaria** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **rhomboides** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **rhomboides** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 317–318, pl. 9, figs. 6*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **subfusiformis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **subfusiformis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 319–318, pl. 9, fig. 7*a*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Ænona n. g. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 74. Phila., 1871. T. A. Conrad.

—— **eufalensis** Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 74. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.

—— **eufaulensis** (Con.) Whitfield. (1884.)
Mon. U. S. Geol. Sur., vol. 9, pp. 168–169, pl. 23, figs. 2, 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **papyria** n. s. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 74. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **papyria** (Con.) Whitfield. (1884.)
Mon. U. S. Geol. Sur., vol. 9, pp. 169–170, pl. 23, fig. 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Æora n. g. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 72. Phila., 1871. T. A. Conrad.

—— **cretacea** n. s. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 72, pl. 8, fig. 8. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **cretacea** (Con.) Whitfield. (1884.)
Mon. U. S. Geol. Sur., vol. 9, pp. 167–168, pl. 23, 23, figs. 16, 17. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Æora—Continued.

—— n. g. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 72. Phila., 1872. T. A. Conrad.

Afer n. sub. gen. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332. Phila., 1855–1858. T. A. Conrad.

Aguileria n. g. White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, pp. 35–37. Phila., 1887. C. A. White.

—— **cumminsi** n. s. White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, p. 37, pl. 2, figs. 1–3. Phila., 1887. C. A. White.
Formation: Cretaceous.
Location: Four miles south of Lewisville, Texas.

Akera (Muller) Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. region. Prelim. Rep. Paleont., Black hills, p. 38. Wash., 1877. R. P. Whitfield.

—— **glans-oryza** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. region. Prelim. Rep. Paleont. Black hills, pp. 38, 39. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near French creek, Black hills, Dakota.

—— **glans-oryza** Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 437–438, pl. 12, fig, 25. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near French creek, Black hills, Dakota.

Alaba (sub. gen. H. & A. Ad.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 335. Wash., 1876. F. B. Meek.

Alasmodonta (sub. gen. Say) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 113. Wash., 1876. F. B. Meek.

Alcyonium ? Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser. 1827–1831, p. 125. Phila., 1827–1831. S. G. Morton.
Form: Cretaceous.
Location: Big Timber creek, Gloucester county, New Jersey.

—— ? Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 81. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Alabama.

Aleoto G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 172. Phila., 1862, 1863. Gabb & Horn.

—— **regularis** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 172, [pl. 21], fig. 63. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous,
Location: New Jersey.

Alectryonia (sub. gen. Fischer) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 11. Wash. 1876. F. B. Meek.

Alipes (sub. gen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 320. Wash., 1876. F. B. Meek.

Alveolites (Lam.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 246. New Haven, 1830. S. G. Morton.

—— **cepularis** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 80. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 245. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand (Cretaceous).
Location: United States.

Amauropsis (Mörch) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 109. Phila., 1864. W. M. Gabb.

—— **alveata** (Con.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 110, pl. 19, fig. 59, plate 21, fig. 111. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: San Diego; Martinez; Clayton; Cañada de los Alizos, near Fort Tejon; Curry's, south of Mount Diablo, Cal.

—— **oviformis** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 109–110, pl. 19, fig. 63. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan Springs, Tehama county, Cal.

—— **paludinæformis** (H. & M. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 318–319, pl. 19, figs. 15a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Sage creek and Cheyenne river, Dakota.

—— **paludinæformis** (H. & M. sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 296. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **paludinæformis** (H. & M. sp.) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 431–432, pl. 12, fig. 16. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Boxelder creek, Black hills.

—— **suciensis** n. s. Whiteaves. (1879.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 2, pp. 123, 124, pl. 16, fig. 1. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, two and a half miles up, Vancouver island, Sucia islands.

Amauropsis—Continued.

—— **tenuistriata** n. s. Whiteaves. (1876.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 1, pp. 48, 49, pl. 9, figs. 4, 4a. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **tenuistriata** Whiteaves. (1884.)
Geol. and Nat. His. Sur. Can.; Mes. Foss., vol, 1, pt. 3, p. 216, pl. 28, fig. 3. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Shingle bay, on Moresby island; bay east of Alliford bay; South island; all in Skidegate inlet.

Amboniocardia n. g. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 24, 25. Wash., 1885. R. P. Whitfield.

—— **cookii** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 25, pl. 2, figs. 11–14. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Clays at Sayre and Fisher's banks near Sayreville, N. J., and at clay banks of R. N. & H. Valentine, near Woodbridge, and at East Brunswick, New Jersey.

Ammonoceratites [Lam.?] Morton. (1841.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 212. Phila., 1839–1842. S. G. Morton

—— **conradi** n. s. Morton. (1841.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, pp. 212, 213, pl. 10, fig. 1. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Near Arneytown, New Jersey.

—— **conradi** Morton. (1841.)
Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843, p. 109. Phila., 1843 S. G. Morton.
Formation: Cretaceous.
Location: Marl pit near Arneytown, New Jersey.

Ammonites abyssinus n. s. Morton. (1841.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 209, pl. 10, fig. 4. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Great Bend of the Missouri river (Lat. 43° 46′ N.)

—— **abyssinus** Morton. (1841.)
Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843 p. 107. Phila., 1843. S. G. Morton.
Formation: Cretaceous.
Location: Upper Missouri.

—— **acuto-carinatus** n. s. Shumard. (1853.)
Expl. Red river, Louisiana, by R. B. Marcy, pp. 209, 210, pl. 3, fig. 1. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Texas.

Ammonites—Continued.

—— **astierianus** (d'Orb.) Eichwald. (1871.)

Geog. Paleont., Bemerk. Halb. Mang. Aleutischen Inseln., pp. 143–145, Taf. 8, fig. 3; Taf. 9, figs. 1, 2. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Chasik island, Tukusitmo bay, Alaska.

—— **ausse[e]anus** (Hauer) Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 25, pl. 3, figs. 16, 17. Phila., 1864. W. M. Gabb.
Formation: Triassic.

—— **barnstoni** n. s. Meek. (1859.)

N. W. Terr.; Rep. Prog. Assin. and Saskat. Expl. Exped. H. Y. Hind, p. 184, pl. 1, figs. 1–3. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: Valley of Mackenzie river, Canada.

—— **batesii** n. s. Trask (1855.)

Proc. Cal. Acad. Nat. Sci., vol. 1, 1st ser., p. 40. San Francisco, 1854–1856. J. B. Trask.
Formation: Secondary [Cretaceous].
Location: Arbuckle's diggings, Shasta county, Cal.

—— **batesii** (Trask) Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 67–68, pl. 13, figs. 16, 16*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Arbuckle's diggings, Shasta county, Cal.; North fork of Cottonwood creek, Shasta county; Bald hills, Shasta county; Benicia, and at Curry's, south of Mount Diablo, Cal.

—— **batesii** (Trask). Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 1, p. 132, pl. 20, figs. 9, *a*, pl. 21, figs. 10, *a*, *b*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **belknapii** n. s. Marcou. (1858.)

Geol. N. Am., p. 34, pl. 2, figs. 1, *a*, *b*. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Near Preston, Texas, in the bed of a little creek flowing into Red river.

—— **billingsi** n. s. Meek. (1859.)

N. W. Terr.; Rep. Prog. Assin. and Saskat. Expl. Exped. H. Y. Hind, pp. 184–185, pl. 2, figs. 4–6. Toronto, 1859. F. B. Meek.
Formation: Cretaceous. ?
Location: Valley of Mackenzie's river, Canada.

—— **billingsianus** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 26–37, pl. 5, fig. 20. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: E. Range, Humboldt, Nevada.

—— **billingsianus** Gabb. (1889.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 8–9, pl. 5, fig. 3. Phila., 1870. Wm. M. Gabb.

Ammonites—Continued.

—— **biplex** ? (Sow.) Grewingk. (1850.)

Verhand. der Russisch. Kaiser. Mineral. Gesells.; Jahrg. 1848–1849, pp. 346–347, pl. 4, figs. 2, *a*, *d*. St. Petersburg, 1850. C. Grewingk.
Formation: Jurassic.
Location: Katmai bay, south coast of Alaska peninsula.

—— **blakei** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 24–25, pl. 4, figs. 14, 15. Phila., 1864. W. M. Gabb.
Formation: Triassic.

—— **borealis** n. s. Morton. (1841.)

Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843, p. 107. Phila., 1843. S. G. Morton.
Formation: Cretaceous.
Location: Upper Missouri.

—— **brazoensis** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 591. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Shovel creek, near Austin; Grayson and Fannin counties; McLennan county, Texas; and from the vicinity of Fort Washita.

—— **brewerii** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 62, pl. 10, fig. 7. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Shasta county (Div. A).

—— **brewerii** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 130–131, pl. 20, fig. 5; pl. 19, figs. 5*a*, *b*, 6, *a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Cal.

—— **brewerii** (Gabb) Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 1, pp. 21–24, pl. 1, figs. 2, 2*a*, 3, 3*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

—— **carlottensis** n. s. Whiteaves. (1876.)

Geol. Surv. Can.; Mes. Foss., vol. 1, pt. 1, pp. 38–39, pl. 6, fig. 5, p. 38. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **carteroni** (d'Orb.) Eichwald. (1871.)

Geog. Paleont., Bemerk. Halb. Mang. aleutischen Inseln. pp. 149–150, Taf. 7, fig. 5; Taf. 10, figs. 1, 2. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: On an island in Kenai bay, Alaska.

—— **cheyennensis** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., pp. 578–579, pl. 7, fig. 2. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Fox Hills, Nebraska.

tes—Continued.

oensis n. s. Trask. (1856.)
l. Acad. Nat. Sci., vol. 1, 1st. ed., p. 85, pl. 2,
and 1a. San Francisco, 1854–1857. J. B.
.
ion: Upper Eocene [Cretaceous].
n: Chico creek, Cal.

oensis (Trask) Gabb. (1864.)
r. Cal., Paleont., vol. 1, pp. 68–69, pl. 13,
7, 17*a*, *b*. Phila., 1864. W. M. Gabb.
ion: Cretaceous.
n: Chico creek, Pence's and Kelly's
os, twelve miles north of Oroville, Butte
y, Siskiyou mountains, Siskiyou county;
o de San Luis Gonzaga, Pacheco's pass,
d county, Cal.

xii n. s. Gabb. (1869.)
r. Conch.; vol. 5, Phila., 1869–1870, pp. 7–8,
g. 2 [and vol. 4. pl. 16.] Phila., 1870. Wm.
bb.
on: Jurassic.
: Cut of the Pacific railroad, station
ec. 53, one mile west of the town of Col-
obinson's ferry, on the Stanislaus river,
a.

plexus n. s. H. & M. (1854.)
n. Acad. Arts and Sci., vol. 5, n. s. pp. 394,
. 4, figs. 1*a–f*. Cambridge and Boston, 1885.
Meek.
on: Cretaceous.
: Great Bend of the Missouri.

plexus? (H. & M.) Gabb.

r. Cal., Paleont., vol. 1, p. 69. Phila.,
W. M. Gabb.
on: Cretaceous.
: Folsom, Cal.

lexus (H. & M.) Meek. (1876.)
S. Geol. Sur. Terr.; vol. 9, pp. 447–448, pl.
. 1*a–c*. Wash., 1876. F. B. Meek.
on: Cretaceous.
: Great Bend of the Missouri, below Fort
.

plexus var. **suciænsis** n. var.
(1861.)
ad. Nat. Sci., Phila., for 1861, p. 317.
1862. F. B. Meek.
n: Cretaceous.
: Sucia island, and at Komooks on Van-
island.

lexus? var. **suciænsis** Meek.

S. Geol. and Geogr. Sur. Terr., vol. 2,
p. 369–370, pl. 5, figs. 2, 2*a–c*. Wash., 1876.
eek.
n: Cretaceous.
: Komooks on Vancouver island, and
sland.

plexus var. **suciænsis** (Meek)
es. (1879.)
Can.; Mes. Foss., vol. 1, pt. 2, pp. 106–108.
al, 1879. J. F. Whiteaves.
n: Cretaceous.
: Sucia islands; Northwest bay, Van-
island; Trent river, Vancouver island.

Ammonites—Continued.

—— **conradi** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 39–40, pl. 16, figs. 1–3: pl. 19, fig. 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie Bluff, Alabama.

—— **conradi** Morton. (1841.)

Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 210. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Great Bend of the Missouri river, Lat. 43° 40′ N.

—— ? **cooperii** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 69–70, pl. 44, figs. 23, 23*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Shaft west side of Point Loma, opposite La Playa, San Diego, Cal.

—— **cordiformis** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 57. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Southwest base of Black hills.

—— **cordiformis** M. & H. (1865.)

Paleont. upper Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 122–123, pl. 5, figs. 2*a–e*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— **cordiformis** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dakota, pp. 378–380, pl. 6, figs. 20–24. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater valley; also, on the tops of the highest hills two miles south of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— **cordiformis** var. **distans**. Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, pp. 380–381, pl. 6, fig. 25. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Two miles south of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— **crenocostatus** n. s. ? Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 1, pp. 45–47, pl. 9, figs. 2, 2*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.
(Whiteaves calls this a provisional name.)

—— **delawarensis** n. s. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, p. 244, pl. 2, fig. 4. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous.]
Location: Chesapeake and Delaware canal.

—— **delawarensis** Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 194. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Deep Cut of the Chesapeake and Delaware canal.

Ammonites—Continued.

—— delawarensis Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 37–38, pl. 2, fig. 5. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal, Alabama.

—— dentato-carinatus n. s. Roemer. (1849.)

Texas, pp. 417–418. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— dentato-carinatus Roemer. (1852.)

Die Kreidebildungen von Texas, pp. 33–34, Taf. 1, figs. 2*a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— doroschini n. s. Eichwald. (1871.)

Geog. Paleont., Bemerk. Halb. Mang. aleutischen Inseln, pp. 138–142, Taf. 7, fig. 6; Taf. 8, figs. 1, 2. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Chasik island, Tukusitun bay, Alaska.

—— dutempleanus (d'Orb.) Eichwald. (1871.)

Geog. Paleont., Bemerk. Halb. Maug. aleutischen Inseln, pp. 142–143, Taf. 7, figs. 3, 4. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kenai bay, Alaska.

—— filicinctus n. s. Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 1, pp. 43–45, pl. 2, figs. 2*a–c* and 3. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— flaccidicosta n. s. Roemer. (1852.)

Kreide von Texas, p. 33, Taf. 1, figs. 1, *a*, *b*, Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— fraternus n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 137–138, pl. 23, figs. 15, *a*. *b*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Benicia, Cal.

—— galpini n. s. E. & S. (1857.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 42. St. Louis, 1856–1866. Evans & Shumard.
Formation: Cretaceous.
Location: On the Cheyenne river, 100 miles above its mouth.

—— gardeni (Baily) Whiteaves. (1879.)

Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 2, p. 102. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bradley creek; bank of the Trent river; ten miles up the Nanaimo river, Vancouver island.

Ammonites—Continued.

—— geniculatus n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 159, pl. 15, figs. 2*a*, *b*. Wash., 1859. T. A. Conrad.
Formation: Cretaceous.
Location: Bed of Rio San Pedro and Leon Springs.

—— gibbonianus (Lea) Marcou. (1858.)

Geol. N. Am., p. 35, pl. 2, figs. 2*a*, *b*. Zurich. 1858. Jules Marcou.
Formation : Cretaceous.
Location : Bed of the Elm fork, one of the affluents of Trinity river, Texas.

—— graysonensis n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 593–594. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Fannin county, near Lowell's bluff, and Grayson county, four miles north of Sherman, Texas.

—— graysonensis (Shumard) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, p. 39, pl. 18, figs. 9*a*, *b*. Wash., 1883. C. A. White.

—— guadalupæ n. s. Roemer. (1849.)

Texas, pp. 416–417. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— guadalupæ Roemer. (1852.)

Kreide von Texas, p. 32, figs. 1, *a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— guadalupæ (Roem.) Gabb. (1872.)

Proc. Acad. Nat. Sci., Phila., for 1872, p. 264, pl. 9, fig. 1, pl. 10, figs. 1, 1a. Phila., 1872. Wm. M. Gabb.
Formation: Cretaceous.
Location: Nugal, near the center of the state of Chihuahua, Mexico.

—— halli n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, pp. 70–71. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above the mouth and one hundred and fifty miles above Milk river, Nebraska.

—— haydenii n. s. Gabb. (1864.)

Geol. Surv. Cal., Paleont., vol. 1, pp. 62–63, pl. 10, figs. 8, 8*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Shasta county, Cal. (Div. A.)

—— henryi n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, pp. 57–58. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Southwest part of Black hills.

Ammonites—Continued.

—— **henryi** M. & H. (1865.)

Paleont. upper Missouri. Smithson. Cont. Knowl., vol. 14, No. 172, pp. 123–124, pl. 5, figs. 9*a–c*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— **hippocrepis** n. s. DeKay. (1827.)

Ann. New York Lyceum Nat. Hist., vol. 2, pp. 273–277, pl. 5, fig. 2 [5]. New York, 1828. J. E. DeKay.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal.

—— **hippocrepis** (DeKay) Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 88–89, pl. 5, fig. 4. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.

—— **hippocrepis** (DeKay) Morton.

Am. Jour. Sci., 1st. ser., vol. 17, p. 280. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand. [Cretaceous].
Location: Deep cut of the Chesapeake and Delaware Canal.

—— **hoffmannii** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 65, pl. 11, figs. 13, 13*a*, pl. 12, 13*b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Horsetown, Shasta county, Cal. (Div. A.)

—— **hoffmannii** Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 131, 132, pl. 20, figs. 8, *a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Cal.

—— **homfrayi** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol., 1, p. 26, pl. 4, figs. 18, 19. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: E. Range, Humboldt, Nevada.

—— **inæquiplicatus** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 591. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Garnet's Bluff, on Red river, Fannin county, Texas.

—— **indra** (Forbes) Whiteaves. (1879.)

Geol. Sur. Can.; Mes. Foss., vol. 1, part 2, pp. 105, 106, pl. 13, figs. 2, 2*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornsby island.

—— **inflatus** (Sow.) Ramirez. (1880.)

An. Min. Fomento Rep. Mex., tomo 3, p. 657, lam. 1, fig. 6. Mexico, 1880. S. Ramirez.
Formation: Cretaceous.
Location: Sierra Mojada, Mexico.

Ammonites—Continued.

—— **ishmæ** (Keys.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln., pp. 146–149, Taf. 8, figs. 4, 5, Taf. 9, fig. 5, Taf. 10, figs. 3–7. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **james-danæ** Barcena. (1878.)

An. Museo Nac. Mex., tomo 1, pp. 285–286, figs. 27–30. Mexico, 1877–1879. M. Barcena.
Formation: Jurassic.
Location: Acaxochitlan, Ferreria de la Trinidad, and abra de Huilacapixtla, state of Pueblo, Mexico. Published in 1874 under the name Amm. danæ "Datos para el estudio de ios rocas mesozoicar de Mexico." Not seen.

—— **jugalis** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 133–134, pl. 22, figs. 12, *a*, *b*, 13*a*. Phila., 1869. W. M. Gabb.
Formation : Cretaceous.
Location : Martinez and Benicia coal mines, near Clayton, Cal.

—— **jukesii?** (Sharpe) Whiteaves. (1879.)

Geol. Sur. Can.; Mes. Foss. vol. 1, part 1, pp. 111, 112, pl. 18, figs. 3, 3*a*, *b*. Montreal, 1879. J. F. Whiteaves.
Formation : Cretaceous.
Location : Norris Rock, a small island about a mile S. 60° E. from Norman point, which is the most southerly part of Hornby island.

—— **laperousianus** n. s. Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss., vol. 1, part 1, pp. 39–41, pl. 3, fig. 3. Montreal, 1876. J. F. Whiteaves.
Formation : Cretaceous.
Location ; Queen Charlotte islands.

—— **lenticularis** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., p. 579, pl. 8, fig. 5. Phila., 1852. D. D. Owen.
Formation : Cretaceous.
Location : Fox hills, Nebraska.

—— **leonensis** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, part 2, p. 160, pl. 16, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.
Formation : Cretaceous.
Location : Texas.

—— ? **lineatus** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 139–140, pl. 23, figs. 18*a–c*. Phila., 1869. W. M. Gabb.
Formation : Cretaceous.
Location : Cottonwood creek, near Folsom, from Rocky corral, Cal.

—— **lœvianus** n. s. White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, part 1, pp. 201–202, pl. 19, figs. 1*a*, *b*. Wash., 1875. C. A. White.
Formation : Cretaceous.
Location : Ojo de los Cuervas, New Mexico.

Ammonites—Continued.

—— **loganianus** n. s. Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss. vol. 1, pt. 1, pp. 27–29, pl. 8, fig. 2, fig. 3, p. 28. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **loganianus** (?) form A. Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss. vol. 1, pt. 1, pp. 29, 30, pl. 4, figs. 2, 2*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **loganianus** (?) form B. Whiteaves. (1876.)

Geol. Sur. Can.; Mes. Foss. vol. 1, part 1, pp. 30–32, pl. 8, figs. 1, 1*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **maclurei** n. s. White. (1889.)

Bull. U. S. Geol. Sur. No. 51, p. 48, pl. 7, figs. 2, 3. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island.

—— **mandanensis** n. s. Morton. (1841.)

Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 208, pl. 10, fig. 2. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Great Bend of the Missouri river (Lat. 43° 40′ N.)

—— **mandanensis**. Morton. (1841.)

Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843, p. 107. Phila., 1843. S. G. Morton.
Formation: Cretaceous.
Location: Upper Missouri.

—— **marciana** n. s. Shumard. (1853.)

Expl. Red river, Louisiana, by R. B. Marcy, p. 209, pl. 4, fig. 5. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Texas.

—— **mcclintocki** n. s. Haughton. (1856.)

Jour. Roy. Dublin Soc., vol. 1, No. 4, pp. 244–245, pl. 9, figs. 2–4. Dublin, 1858. S. Haughton.
Formation: Jurassic.
Location: Point Wilkie, Prince Patrick's land.

—— **mcclintocki**. Haughton. (1859.)

The voyage of the *Fox* in the Arctic Seas, p. 392. McClintock, London, 1859. App. B., S. Haughton.
Formation: Lias [Jurassic.]
Location: Wilkie point, Prince Patrick's land (Lat. 76° 20′ N.; long. 117° 20′ W.).

—— **meekianus** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 592, 593. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Near Post Oak creek, Grayson county, Texas.

Ammonites—Continued.

—— **milletianus** (d'Orb.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln., pp. 145–146, Taf. 9, figs. 3, 4. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **moreauensis** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., p. 579, pl. 8, fig. 7. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Fox hills of Nebraska.

—— **mullanus** n. s. M. & H. (1862.)

Proc. Acad. Nat. Sci., Phila., for 1862, pp. 23–25. Phila., 1863. Meek & Hayden.
Formation: Cretaceous.
Location: Chippewa point, near Fort Benton, on the upper Missouri.

—— ? **mullanus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 607–609, pl. 8, figs. 1*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Chippewa point, near Fort Benton, on the upper Missouri.

—— **nebrascensis** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., pp. 577–578, pl. 8, figs. 3, 3*a*, pl. 8*a*, fig. 2. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Fox hills, Nebraska.

—— **nebrascensis** ? Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., p. 578, pl. 8, fig. 2. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Fox hills, Nebraska.

—— **nebrascensis** (Owen) Marcou. (1853.)

Geol. map of the U. S. and Brit. Prov. of N. A., p. 46, pl. 7, fig. 4. Boston, 1853. Jules Marcou.
Formation: Cretaceous.
Location: A little north of Fort Pierre, Nebraska.

—— **nevadanus** n. s. Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 6, 7, pl. 3, figs. 1, 1*a* [and vol. 4, pl. 16]. Phila., 1870. Wm. M. Gabb.
Formation: Jurassic.
Location: Volcano, about thirty miles southeast of Walker's lake, Nevada.

—— **nevadensis** (Gabb) Meek. (1870.)

Proc. Am. Philos. Soc., vol. XI, 1869, 1870, p. 428. Phila., 1871. F. B. Meek.
Formation: Jurassic.
Location: Between Sacramento and Summit station, Cal.

—— **newberryanus** n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, pp. 47–48. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

es—Continued.

erryanus (Meek) Gabb. (1864.)

. Cal., Paleont., vol. 1, pp, 61–62, pl.
. 5, 6, 6*a*, *b*, pl. 27, fig. 199*a–a*. Phila.;
W. M. Gabb.
n : Cretaceous.
: Comax ("Koomooks" of Meek), Van-
island ; north fork of Cottonwood creek,
county; Martinez and Clayton, and south
nt Diablo, Contra Costa county, Cal.,
ver island.

erryanus Meek. (1876.)

. Geol. and Geogr. Sur. Terr., vol. 2,
p. 367–368, pl. 4, figs. 3, 3*a*, 3*b*. Wash.,
. B. Meek.
.: Cretaceous.
Sucia island.

erryanus (Meek) Whiteaves.

Can.; Mes. Foss. vol. 1, pt. 2, pp. 109–
.4, figs. 1, 1*a*. Montreal, 1879. J. F.
es.
: Cretaceous.
Northwest side of Hornby island;
river; lower part of the Trent river;
t side of Denman island; Northwest
.; Sucia islands.

erryanus (Meek) White.

Geol. Sur. No. 51, p. 48. Wash., 1889.
ite.
: Cretaceous.
Sucia island.

tii n. s. Morton. (1841.)

Nat. Sci., Phila., vol. 8, 1st ser. 1839–
40, pl. 10, fig. 3. Phila., 1839–1842.
ton.
Cretaceous.
Great Bend of the Missouri river
40′ N.).

exicani n. s. Marcou. (1858.)

., pp. 35–36, pl. 1, figs. 2, 2*a*. Zurich,
es Marcou.
Cretaceous.
lot far from Albuquerque, and also
, New Mexico.

n. s. Owen. (1852.)

ur. Wis., Iowa, Minn., p. 579, pl. 8,
ila., 1852. D. D. Owen.
Cretaceous.
reat Bend of the Missouri.

lis (v. Buch) Roemer. (1849.)

. Bonn, 1849. F. Roemer.
Cretaceous.
edericksburg, Texas.

lis (v. Buch) Roemer. (1852.)

exas, p. 34, Taf. 1, figs. 3*a–c*. Bonn,
Roemer.
Cretaceous.
edericksburg, Texas.

Ammonites—Continued.

—— **pedernalis (v. Buch) Gabb. (1869.)**

Geol. Surv. Cal., Paleont., vol. 2, pp. 258–259, pl. 35, figs. 1, 1*a*. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **percarinatus n. s. H. & M. (1854.)**

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 396, pl. 4, figs. 2*a–c*. Cambridge and Boston, 1853. Hall & Meek.
Formation: Cretaceous.
Location: Missouri river, five miles below the mouth of the Vermilion.

—— **percarinatus (H. & M.) Newberry. (1861.)**

Rep. Colorado river of the West. Part 3, pp. 117, 118, Wash., 1861. J. S. Newberry.
Formation: Cretaceous.

—— **percostatus Gabb. (1869.)**

Geol. Sur. Cal., Paleont., vol. 2, pp. 138–139, pl. 24, fig. 19. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **perezianus n. s. Whiteaves. (1876.)**

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 19–21, pl. 2, figs. 1, 1a. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **peruvianus (de Buch) Marcou. (1858.)**

Geol. N. Am., pp. 34–35, pl. 5, figs. 1, 1*a*, *b*. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Bed of Elm Form river, an affluent of Trinity river, Texas.

—— **peruvianus (de Buch?) Gabb. (1864.)**

Geol. Sur. Cal., Paleont., vol. 1, p. 63, pl. 10, fig. 9. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan Springs, Tehama county, Cal.

—— **pierdenalis n. s. von Buch. (1848.)**

Abhandl. Akad. der Wissenschaften, p. 30*a*, pl. 6, figs. 8, 9, 10, 1848, Berlin, 1850.
Formation: Cretaceous.
Location: Pedernales river, Texas.

—— **placenta n. s. DeKay. (1827.)**

Ann. New York Lyceum Nat. Hist., vol. 2, p. 278, pl. 5, fig. 3 [2]. New York, 1828. J. E. DeKay.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal.

—— **placenta (DeKay) Morton. (1830.)**

Am. Jour. Sci., 1st ser., vol. 17, pp. 279–280. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location: Deep cut of the Chesapeake and Delaware canal.

—— **placenta (DeKay) Morton. (1830.)**

Am. Jour. Sci., 1st ser., vol. 18, pl. 2, figs. 1–3, New Haven, 1830. S. G. Morton.

Ammonites—Continued.

—— placenta (DeKay) Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 195–196, pl. 5, fig. 4. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.

—— placenta (DeKay) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 36–37, pl. 2, figs. 1, 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Deep cut of the Chesapeake and Delaware canal, New Jersey; southern bend of the Tennessee river.

—— placenta (De Kay) Morton. (1841.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 210. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Great Bend of the Missouri. (Lat. 43° 40′ N.)

—— placenta (De Kay) Meek. (1859.)
N. W. Terr.; Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 184, Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: South branch of the Saskatchewan, Canada.

—— placenta (De Kay) Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Fountain creek, Colorado city, Colorado.

—— placenta (De Kay) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 278. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Georgia.

—— placenta var. intercalaris, n. var. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 177. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Cheyenne river, Nebraska.

—— planicosta (Sow.) Ramirez. (1880.)
An. Min. Fomento Rep. Mex., tomo 3, p. 657. lam. 1, fig. 7. Mexico, 1880. S. Ramirez.
Formation: Cretaceous [?]
Location: Sierra Mojada, Mexico.

—— pleurisepta n. s. Conrad. (1854.)
Rep. U. S. & Mex. Bound. Sur., vol. 1, pt. 2, p. 159, pl. 15, figs. 1*a–c*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: *Jacun, 3 miles below Laredo.*

[This region is now known to be occupied by Eocene rocks, therefore the locality as above given by Mr. Conrad is evidently a mistake].

—— ramosus (Meek) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 65, pl. 11, figs. 12, 12*a*, pl. 12, fig. 12*b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

Ammonites—Continued.

—— ramsaueri (Quenst.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 27, pl. 3, figs. 21, 21*a*. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Gifford's ranch, Plumas county, Cal.

—— rémondii n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 66–67, pl. 12, figs. 14, 14*a*, 15. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Shasta county, Cal. (Div. A).

—— richardsonii n. s. Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 32, 33, pl. 5. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

—— riorii n. s. N. & G. (1840.)
Bull. Roy. Acad. Sci., Bruxelles, tome 7, pt. 2, pp. 217–218, fig. 8. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehuacan, Mexico.

—— selwynianus n. s. Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 104–105, pl. 13, figs. 1, 1*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— serrato-carinatus n. s. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, pp. 429–430. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Medicine Bow river.

—— shumardi n. s. Marcou. (1858.)
Geol. N. Am., pp. 33–34, pl. 1, figs. 1, 1*a*. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Borders of Red river, near Preston, Texas.

—— skidegatensis n. s. Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 34–37, pl. 7, pl. 9, fig. 1, fig. 4, p. 34. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

—— stoliczkanus n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 135, 136, pl. 23, figs. 16, *a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

—— stoliczkanus var. spiniferus n. var. Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 24, 27, pl. 3, fig. 3; pl. 4, figs. 1, 2, p. 24. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

Ammonites—Continued.

—— **subtricarinatus** (d'Orb.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 60–61, pl. 10, figs. 4, 4*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Vicinity of Battle creek, Tehama county, Cal.

—— **suciaensis** (Meek) Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 133. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Near Monte Diablo, Cal.

—— **swallovii** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 591–592. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Grayson county, four and a half miles north of Sherman, and bluffs of Red river, in Fannin and Lamar counties, Texas.

—— **swallovii** (Shumard) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 39, pl. 18, fig. 1*a*. Wash., 1883. C. A. White.

—— **syrtalis** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 40, pl. 14 [16], fig. 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Greene county, Alabama.

—— **tehamaensis** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 132, 133. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **telifer** n. s. Morton. (1833.)
Am. Jour. Sci., 1st. ser., vol. 23, p. 290. New Haven, 1833. S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location: Delaware.

—— **telifer** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 38, pl. 2, fig. 7. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **texanus** n. s. Roemer. (1849.)
Texas, p. 417. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels and Austin, Tex.

—— **texanus** Roemer. (1852.)
Kreide. von Texas, pp. 31–32, Taf. 3, figs. 1, *a–e*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Austin and at waterfall of the Guadalupe below New Braunfels, Texas.

—— **texanus** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 159–160, pl. 16, figs. 1*a–d*. Wash., 1859. T. A. Conrad.
Formation: Cretaceous.
Location: Near Puercos river.

Ammonites—Continued.

—— **timotheanus** (Mayor) Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 41, 42, pl. 3, figs. 2, 2*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **traskii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 63–64, pl. 11, fig. 11, pl. 12, fig. 11. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Arbuckle's diggings, Shasta county, Cal. (Div. A).

—— **traskii** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 131, pl. 19, figs. 7*a*, *b*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Cal.

—— **trinitensis** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 278. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Texas.

—— **turneri** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, pp. 26–27, pl. 5, figs. 1 and 2. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Curry's Cañada, south of Mount Diablo, Cal.

—— **vancouverensis** n. s. Meek. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 317, 318. Phila., 1862. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, eastern shore of Vancouver island.

—— **vancouverensis** (Meek) Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 103. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **vanuxemi** n. s. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 244, pl. 3, figs. 3, 4. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous.]
Location: Chesapeake and Delaware canal.

—— **vanuxemi** Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 194, 195. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Chesapeake and Delaware canal.

—— **vanuxemi** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 38, pl. 2, figs. 3, 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Chesapeake and Delaware canal.

Ammonites—Continued.

—— **valledæ** (Michelin) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 103, 104. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **vermilionensis** n. s. M. & H. (1860).

Proc. Acad. Nat. Sci., Phila., for 1860, p. 177. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Vermilion river, Nebraska.

—— **vespertinus** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 40–41, pl. 17, fig. 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Plains of Kiamesha, Arkansas.

—— **vespertinus** (Mort.) Shumard. (1853.)

Expl. Red river, Louisiana, by R. B. Marcy, p. 209. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Near Fort Washita, Indian Territory.

—— **walcotti** n. s. Hill. (1888.)

Ann. Rep. Geol. Sur. Arkansas, for 1888, vol. 2, pp. 128–129, pl. 1, figs. 1, 1*a*, 1*b*. Little Rock, 1888.. R. T. Hill.
Formation: Cretaceous (?).
Location: Mouth of Caney creek, branch of Prairie creek, near Murfreesboro, Pike county, Arkansas.

—— **whitneyi** n. s. Gabb. (1869.)

Geol. Surv. Cal., Paleont., vol. 2, pp. 134–135, pl. 22, figs. 14*a*, *b*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

—— **wosnessenskii** n. s. Grewingk. (1850.)

Verhand. der Russisch-Kaiserlichen Mineral Gesells., pp. 344–346, pl. 4, fig. 1*a*–*d*. St. Petersburg, 1850. C. Grewingk.
Formation: Jurassic.
Location: Katmai bay, south coast of Alaska peninsula.

—— (Amaltheus) **Whiteavesii** n. s. White. (1889.)

Bull. U. S. Geol. Sur. No. 51, pp. 69–90, pl. 13, figs. 1–5. Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Kialagvic bay, Alaska.

—— (Lillia) **howelli** n. s. White. (1889.)

Bull. U. S. Geol. Sur. No. 51, pp. 68–69, pl. 12, figs. 1 and 2, pl. 14, figs. 1–3. Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Kialagvic bay, Alaska.

—— (Lillia) **kialagvikensis** n. s. White. (1889.)

Bull. U. S. Geol. Sur. No. 51, p. 69, pl. 13, fig. 7. Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Shores of Kialagvic bay, Alaska.

Ammonites—Continued.

—— (Scaphites ?) **ramosus** n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, pp. 45–47. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— sp. A. Whiteaves. (1874.)

Geol. Sur. Can. Rep. Prog. for 1873–1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— sp. B. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— sp. C. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay. Vancouver island.

—— (Brug.) Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, p. 44. New Haven, 1820. Thomas Say.
Formation: Alluvium [Cretaceous].
Location: New Jersey.

—— ? DeKay. (1827.)

Ann. New York Lyceum Nat. His., vol. 2, p. 278, pl. 5, figs. 4 and 5 [3 and 4]. New York, 1828. J. E. DeKay.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal.

—— sp. undet. Roemer. (1849.)

Texas, p. 418. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Texas.

—— sp. undet. Shumard. (1853.)

Expl. Red river, Louisiana, by R. B. Marcy, p. 210, pl. 6, fig. 4. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Texas.

—— sp. undet. Meek. (1859.)

N. W. Terr., Rep. Prog. Assin. and Saskat, Expl. Exped. H. Y. Hind, p. 184. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: Two Creeks, Canada.

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol., 11, 1869–1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Fountain creek, Colorado city, Colo.

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Mission station, N. P. R. R.

Ammonites—Continued.

—— sp. undet. Toula. (1874.)

Die Zweite Dutsche Nordpolarfahrt, Zweiter Band, p. 600. Leipsig, 1874. Frans Toula.

Formation: Jurassic. [Cretaceous ?].

Location: Kuhn island, east coast of Greenland.

—— sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 262. Montreal, 1874. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nanaimo river, Vancouver island, 10 miles up.

—— sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 264, Montreal, 1874. J. F. Whiteaves.

Formation: Cretaceous.

Location: Below Dodd Narrows.

—— sp. undet. Whiteaves. (1876.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, p. 47, pl. 3, figs. 4, 4a. Montreal, 1876. J. F. Whiteaves.

Formation: Cretaceous.

Location: Queen Charlotte islands.

—— sp. undet. Hill. (1889.)

Geol. Sur. Texas, Bull. No. 4, p. 22. Austin, 1889. R. T. Hill.

Formation: Cretaceous.

Location: Cow creek beds, near Travis Peak, Texas.

—— Schiel. (1854.)

Rep. Expl. and Sur. R. R. R. Mississippi river to Pacific ocean, vol. 2; Rep. Expl. 41st parallel, N. Lat., p. 109, pl. 3, fig. 12. Wash., 1855. James Schiel.

Formation: Cretaceous.

Location: Grand river.

—— White. (1878.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 186. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Valley of Little Thompson creek, Colorado.

Ampullina (?) Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 161. Phila., 1869. W. M. Gabb.

—— **striata** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 161–162, pl. 27, fig. 40. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Martinez, Cal.

Amusium conradi n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 52–53, pl. 7, figs. 8–10. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, New Jersey.

—— **lenticulare** nom. prov. Whiteaves. (1884.)

Geol. & Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, pp. 242–243, pl. 32, fig. 5. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: North shore of Cumshewa inlet.

Amusium—Continued.

—— **simplicum** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 51–52, pl. 7, figs. 11, 12. Wash., 1885. R. P. Whitfield.

Formation: Cretacious.

Location: Monmouth county, New Jersey.

Amussium (Klein). Meek. (1865.)

Geol. Sur. Cal., Geology, vol. 1, p. 478. Phila., 1865. F. B. Meek.

—— **aurarium** n. s. Meek. (1865.)

Geol. Sur. Cal., Geology, vol. 1, pp. 478–479, pl. 1, figs. 6, 6a. Phila., 1865. F. B. Meek.

Formation: Jurrassic [Cretaceous?]

Location: Mariposa estate, California.

Anadema sub. gen. (H. & A. Adams) White. (1889.)

Bull. U. S. Geol. Sur. No. 51, p. 17. Wash., 1889. C. A. White.

Ananchytes (Lam.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, p. 245. New Haven, 1830. S. G. Morton.

—— **cinctus** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 7. New Haven, 1830. S. G. Morton.

—— **cinctus** Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, p. 200. Phila., 1827-1831. S. G. Morton.

Formation: Cretaceous.

—— **cinctus** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 78. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey.

—— **cruciferus** n. s. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, p. 245, pl. 3, fig. 8. New Haven, 1830. S. G. Morton.

Formation: Ferruginous sand [Cretaceous.]

Location: New Jersey.

—— **cruciferus** Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, p. 201. Phila., 1827-1831. S. G. Morton.

Formation: Cretaceous.

—— **fimbriatus** n. s. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pp. 245–246, pl. 3, fig. 9. New Haven, 1830. S. G. Morton.

Formation: Ferruginous sand [Cretaceous.]

Location: New Jersey.

—— **fimbriatus** Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 200–211. Phila., 1827-1831. S. G. Morton.

Formation: Cretaceous.

—— **fimbriatus** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 78–79, pl. 3, fig. 20. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey.

Ananchytes—Continued.

—— **sp. undet. Morton.** (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous.]
Location: United States.

Anatimya n. sub gen. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 276. Phila., 1858–1860. T. A. Conrad.

Anatina (Lam.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 324. Phila., 1862. Wm. M. Gabb.

—— **elegans n. s. Eichwald.** (1871.)
Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln., pp. 119–121. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak and Unalaska islands, Alaska.

—— **elliptica n. s. Gabb.** (1861.)
Proc. Acad. Nat. Sci., Phila. for 1862, p. 224, Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, New Jersey.

—— **inequilateralis n. s. Gabb.** (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 151, pl. 29, fig. 241. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North side of Siskiyou mountains, Oregon, near the stage road.

—— **? lata n. s. Gabb.** (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 151, pl. 22, fig. 126. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's Ranch, Butte county, Cal.

—— **quadrata n. s. Gabb.** (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 177, pl. 29, fig. 64. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: North shore of Departure bay, Nanaimo, Vancouver island.

—— **sulcatina n. s. Shumard.** (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861 1862, pp. 204, 205. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point, Navarro county, Texas.

—— **sulcatina (Shumard) Whiteaves.** (1879.)
Geol. Sur. Can., Mes. Foss. vol. 1, pt. 2, pp. 139, 140, pl. 17, figs. 5, 5a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **sulcatina (Shumard ?) White.** (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 43–44, pl. 6, fig. 1. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island.

—— **tryoniana n. s. Gabb.** (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 150–151, pl. 29, fig. 240. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Anatina—Continued.

—— **tryoniana (?) (Gabb) Whiteaves.** (1874.)
Geol. Sur. Can.; Rep. Prog. for 1873–1874, p. 265. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— **tryoniana (Gabb) Whiteaves.** (1879.)
Geol. Sur. Can., Mes. Foss. vol. 1, pt. 2, p. 140. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— **? sp. undet. Whiteaves.** (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-fourth and two and one-half miles up.

Anchistoma parvulum n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 19–20, pl. 3, figs. 2, 2a, b. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Old Man river, two miles above Ryegrassflat, Canada.

Anchura n. g. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 284. Phila., 1858–1860. T. A. Conrad

—— **(Conrad typical.) Meek.** (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 324. Wash., 1876. F. B. Meek.

—— **abrupta n. s. Conrad.** (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 284–285, pl. 47, fig. 1. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Mississippi.

—— **abrupta (Conrad) Gabb.** (1868.)
Am. Jour. Conch., vol. 4, p. 145, pl. 14, fig. 13. Phila., 1868. Wm. M. Gabb.
Formation: Cretaceous.

—— **americana (E. & S. sp.) White.** (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 185. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek, Colorado.

—— **americana (E. & S. sp.) Whiteaves.** (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 48–49. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South branch of the Saskatchewan; Ross creek, near Irvine station, on the Canadian Pacific railway; Old Wives creek, township 10, range 11, west of 3rd principal meridian: North Woody mountain, on a branch of Old Wives creek, in township 6, range 4, west of the same meridian, Canada.

ra—Continued.

narum (Morton sp.) Gabb.
)
Acad. Nat. Sci., Phila., for 1876, p. 298.
la., 1876. Wm. M. Gabb.
ation: Cretaceous.
ion: Pataula creek, Georgia.

lla n. s. Conrad. (1874.)
th Ann. Rep. U. S. Geol. and Geogr. Sur.
., p. 455. Wash., 1874. T. A. Conrad.
ation: Cretaceous.
on: [Near Denver and in the South Park,
rado.]

arinifera n. s. Gabb. (1869.)
Sur. Cal., Paleont., vol. 2, p. 166, pl. 28,
16. Phila., 1869. W. M. Gabb.
tion: Cretaceous.
on: Martinez, Cal.

lis (Gabb) Whiteaves. (1879.)
Sur. Can., Mes. Foss., vol. 1, part 2, p. 123.
treal, 1879. J. F. Whiteaves.
tion: Cretaceous.
on: Sucia islands.

iformis Gabb. (1868.)
our. Conch., vol. 4, p. 145, pl. 14, fig. 14.
., 1868. Wm. M. Gabb.
tion: Cretaceous.

iformis. Gabb. (1869.)
ur. Cal., Paleont., vol. 2, p. 165. Phila.,
W. M. Gabb.
tion: Cretaceous.
on: Chico creek, Cal.

usiformis (Meek MSS.) White.

eogr. and Geol. Expl. and Sur. west of
meridian, vol. 4, part 1, pp. 190–191, pl.
g. 4*a*. Wash., 1875. C. A. White.
ion: Cretaceous.
n: East bank of Rio Puerco, six miles
Casa Salazan; six miles west of Seboetto;
erro Rotunda, New Mexico.

siformis n. s. Meek. (1877.)
eol. Expl. 40th parallel, vol. 4, part 1, pp.
61, pl. 15, figs. 2, 2*a*. Wash., 1877. F.
ek.
ion: Cretaceous.
n: Water tank two miles from Coalville,
, and on Chalk creek above Coalville.

formis (Meek) White. (1879.)
h Ann. Rep. U. S. Geol. and Geogr. Sur.
, p. 238. Wash., 1879. C. A. White.
ion: Cretaceous.
n: Coalville, Utah.

deni n. s. White. (1879.)
h Ann. Rep. U. S. Geol. and Geogr. Sur.
, p. 185. Wash., 1879. C. A. White.
ion: Cretaceous.
n: Fossil ridge, Colorado.

Anchura—Continued.

—— **haydeni** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 311, 312, pl. 7, fig. 1*a*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fifteen miles west of Greeley, Colo., and about six miles south of Fort Collins.

—— **monilifera** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 262, pl. 35, fig. 7. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de los Conchas, near Arivechi, Sonora, Mexico.

—— ? **newberryi** n. s. Meek. (1876.)
Rep. Expl. Exped. Santa Fe, New Mexico, to junction of Grand and Green rivers, pp. 129–130, pl. 2, fig. 5. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Rio de la Plata.

—— **nuptialis** n. s. White. (1874.)
Prelim. Rep. Invert. Foss.; Geogr. and Geol. Expl. and Sur. west of 100th Meridian, p. 24. Wash., 1874. C. A. White.
Formation: Jurassic? Cretaceous.
Location: Fifty miles north of Camp Apache, and five miles west of Mineral Spring, Arizona.

—— ? **parva** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 328, pl. 19, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from its mouth.

—— **prolabiata** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 121–122. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab and Sink Spring, Utah.

—— **rostrata** (Mort.) Conrad. (1875).
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 12, pl. 2, fig. 28. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.
Inadvertently called A. rostrata. Should be A. pennata. See Proc. Acad. Nat. Sci., Phila., for 1876, p. 275. Phila., 1876.

—— **ruida** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 120–121. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, Utah.

—— **stenoptera** (Goldf. sp.) Whiteaves. (1879.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 2, p. 123, pl. 15, figs. 11, 11*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, two miles and a quarter up, Vancouver island.

Anchura—Continued.

—— ? **sublevis.** (M. & H.) Meek (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 327-328, pl. 19, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
Formation : Cretaceous.
Location : Yellowstone river, one hundred and fifty miles from its mouth.

—— ? **sublevis** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, p. 428. Wash., 1880. R. P. Whitfield.
Formation : Cretaceous.
Location : Near Box-elder creek, Black hills, Dakota.

—— **texana** (Roem. sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 298, 299. Phila., 1876. Wm. M. Gabb.
Formation : Cretaceous.

—— **transversa** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 165, pl. 27, fig. 45. Phila., 1869. W. M. Gabb.
Formation : Cretaceous.
Location : Martinez, Cal.

—— (Drepanocheilus) **americana** Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, pp. 35-36. Wash., 1864. F. B. Meek.
Formation : Cretaceous.
Location : Idaho.

—— (Drepanocheilus) **americana.** (E. & S. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 325-326, pl. 32, figs. 8*a*, *b*. Wash., 1876. F. B. Meek.
Formation : Cretaceous.
Location : Moreau river, Long lake, and other localities ; Yellowstone river.

—— (Drepanocheilus) **mudgeana** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 312-313, pl. 7, figs. 3*a*, *b*. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Denison, Texas.

—— (Drepanocheilus) **nebrascensis.** (E. & S. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 326-327, pl. 19, figs. 5*a*-*c*. Wash., 1876. F. B. Meek.
Formation : Cretaceous.
Location : Crow creek, near Black hills; also on Sage creek, near the Bad Lands of White river.

—— (Drepanocheilus) **nebrascensis** (E. & S.) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, p. 429, pl. 12, figs. 2, 3. Wash., 1880. R. P. Whitfield.
Formation : Cretaceous.
Location : On the east fork of Beaver creek, three miles west of Camp Jenney, Black hills.

—— (Drepanocheilus) **prolabiata** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 313-314, pl. 7, fig. 2*a*. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Upper Kanab and Sink Spring, Utah.

Anchura—Continued.

—— (Drepanocheilus) **ruida** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 312, pl. 7, figs. 4, *a*, *b*. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Upper Kanab, southern Utah.

—— **sp. undet.** Meek. (1870.)
Proc. Am. Philos. Soc., vol. XI, 1869, 1870, p. 43
Phila., 1871. F. B. Meek.
Formation : Cretaceous.
Location : Dodson's ranch.

—— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 229-230. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Dodd's ranch on Ashley's fork, Utah

Ancillaria (Lam.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 100. Phila., 1864. W. M. Gabb.

—— **elongata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 100, pl. 18, fig. 54. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Near San Diego, east of Mount Diablo, and Clayton, Cal.

Ancyloceras (d'Orb.) Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 265. Phila., 1856. T. A. Conrad.

—— **approximans** n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 266. Phila., 1856. T. A. Conrad.
Formation : Cretaceous.
Location : Arkansas.

—— **annulatum** (Shumard) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., Part 1, p. 39, pl. 18, figs. 10*a*, *b*. Wash., 1883. C. A. White.

—— **annulatus** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856-1860, p. 5
St. Louis, 1856-1860. B. F. Shumard.
Formation : Cretaceous.
Location : Shawnee creek, Grayson county, Texas.

—— ? **cheyennensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 71, 72. Phila., 1857. Meek & Hayden.
Formation : Cretaceous.
Location : Mouth Cheyenne river, Nebraska.

—— **jenneyi** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky mountain region : Prelim. Rep., Paleont., Black hills, pp. 42-43. Wash., 1877. R. P. Whitfield.
Formation : Cretaceous.
Location : On the east fork of Beaver creek, three miles west of Camp Jenney, Black hills.

Ancyloceras—Continued.

—— **jenneyi** (Whitfield) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 452-454, pl. 16, figs. 7-9. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the east fork of Beaver creek, three miles west of Camp Jenney, Black hills.

—— **jenneyi** (Whitfield?) Stanton. (1887.)
Proc. Colorado Sci. Soc., vol. 2, pt. 3, for 1887, p. 187. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colorado.

—— **mortoni** (H. & M. sp.) H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, p. 411. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.

—— ? **nebrascensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 71. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Iquor creek, north fork, Cheyenne, Nebraska.

—— ? **nicolletii** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 397-398, pl. 4, fig. 4. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Great Bend of the Missouri.

—— **percostatus** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 138-139, pl. 24, fig. 19. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **percostatus** (Gabb) Whiteaves. (1882.)
Proc. and Trans. Roy. Soc. Canada, vol. 1, sec. 4, p. 82. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: North slope of Jackass mountain, Canada.

—— **rémondi** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 138, pl. 23, fig. 17. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **rémondi** (Gabb) Whiteaves. (1882.)
Proc. and Trans. Roy. Soc. Canada, vol. 1, sec. 4, pp. 82, 83. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: West side of Fraser river, below Lytton and opposite Boston bar, north slope of Jackass mountain, Canada.

—— **rémondi** (Gabb) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 212, pl. 28, figs. 2, 2a. Montreal,
Formation: Cretaceous.
Location: North Shore of Cumshura inlet.

Ancyloceras—Continued.

—— **tricostatus** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. region: Prelim. Rep. Paleont., Black hills, pp. 43-44, Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne, near French creek, Black hills, Dakota.

—— **tricostatus** (Whitfield) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 454-455, pl. 15, figs. 7, 8. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne, near French creek, Black Hills.

—— ? **uncum** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9. pp. 409-410, pl. 21, figs. 1a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: South fork of Cheyenne river, near the Black hills.

—— (**Hamites**) **uncus** n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, pp. 56-57. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: South fork of Cheyenne river, near the base of Black hills.

—— **sp. undet.** Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 78-79, pl. 15, figs. 30, 30a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Arbuckle's diggings, Cal.

Angaria (Bolt.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 121. Phila., 1864. W. M. Gabb.

—— **cingulata** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 264, pl. 35, fig. 9. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de los Conchas, near Arivechi, Sonora, Mexico.

—— **ornatissima** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 121, pl. 20, fig. 78. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas Flat, Placer county, Tuscan Springs, Cal.

Angulus (sub. gen. Schumacher) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

Anisomyon n. g. M. & H. (1859.)
Am. Jour. Sci., 2d ser., vol. 29, pp. 33-35. New Haven, 1860. Meek & Hayden.

—— **alveolus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 293, pl. 18, figs. 4, a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth.

Anisomyon—Continued.

—— alveolus (M. & H.) Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, pp. 433–434, pl. 12, fig. 20. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman fork of the Cheyenne river, Black hills.

—— alveolus (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can. Cont. Can., Paleont., vol. 1, pt. 1, p. 47. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: White Mud river (or Frenchman's creek) near the 49th parallel and south of Woody mountain, Canada.

—— borealis (Mort. sp.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, pp. 193–194, pl. 18, figs. 9*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Gallinas creek, New Mexico.

—— borealis (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 288–289, pl. 18, figs. 9, *a–e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri below Fort Pierre.

—— borealis (Mort.) Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, p. 436, pl. 12, figs. 21–23. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Cheyenne river, Black hills.

—— borealis (Morton) Stanton. (1887.)

Proc. Colorado Sci. Soc., vol. 2, pt. 3, for 1887, p. 185, [Denver, 1888]. T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colorado.

—— centrale n. s. Meek. (1871.)

Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 312. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Box-elder and Colorado city, Colorado.

—— centrale (Meek) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, pp. 194–195, pl. 18, figs. 8*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Gallinas creek, New Mexico.

—— centrale (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 225. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near White river Indian agency, Colorado.

—— centrale (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 206. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colorado.

—— centrale (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 303–304, pl. 9, figs 1*a–d*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Box-elder and Colorado city, Colorado.

—— centrale (Meek) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can. Cont. Can. Paleont., vol. 1, pt. 1, pp. 47–48, pl. 7, figs. 1, 1*a*, 2, 2*a*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Old Wives creek, township 10, range 11, west of 3d principal meridian, Canada.

—— haydeni n. s Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 198. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point, Navarro county, Texas.

—— meekii n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 142, pl. 21, fig. 105. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Cal.

—— meekii (Gabb?) var. Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 129–130. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Banks of Trent river, above the falls, Vancouver island.

—— patelliformis n. s. (M. & H.) (1859.)

Am. Jour. Sci., 2d ser., vol. 29, pp. 33–35, pl. 1, figs. 1–3. New Haven, 1860. Meek & Hayden.
Formation: Cretaceous.
Location: Nebraska.

—— patelliformis (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 290–291, pl. 18, figs. 5*a–c*, and *e*?. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth.

—— patelliformis (M. & H.) Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, p. 435, pl. 12, figs. 17, 18. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman fork, Black hills.

—— sexsulcatus (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 293, pl. 18 figs. 8*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and sixty miles from its mouth.

—— sexsulcatus (M. & H.?) Meek. (1877.)

Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, p. 162 figs. 4, 5. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Outer sandstone ridge, southeast of La Porte, Colorado.

yon—Continued.

umardi (M. & H.) Meek. (1876.)
. S. Geol. Sur. Terr., vol. 9, pp. 289–290,
8, figs. 7*a–c*. Wash., 1876. F. B. Meek.
ation: Cretaceous.
on: Great bend of the Missouri, below Fort
re.

ovatus (M. & H.) Meek. (1876.)
. S. Geol. Sur. Terr., vol. 9, pp. 291–292,
8, figs. 5*d* and 6. Wash., 1876. F. B. Meek.
tion: Cretaceous.
on: Yellowstone river, one hundred and
miles above its mouth.

bovatus (M. & H.) Whitfield.
)
eol. Black hills of Dakota, pp. 434–435, pl.
g. 19. Wash., 1880. R. P. Whitfield.
tion: Cretaceous.
on: On Old Woman fork.

undet. Meek. (1870.)
m. Philos. Soc., vol. 11, 1869–1870, p. 429.
., 1871. F. B. Meek.
tion: Cretaceous.
n: Valley of Fountain creek, Colorado.

undet. Hill. (1889.)
ur. Texas, Bull. No. 4, p. 20. Austin, 1889.
Hill.
ion: Cretaceous.
n: San Antonio, Texas.

ynchus (sub. gen. Con.) Meek.

. S. Geol. Sur. Terr., vol. 9, p. 241. Wash.,
F. B. Meek.

(sub. gen. Fitzinger.) Meek.

S. Geol. Sur. Terr., vol. 9, p. 536. Wash.,
F. B. Meek.

a (Cuvier) White. (1878.)
. S. Geol. and Geogr. Sur. Terr., vol. 4,
p. 709. Wash., 1878. C. A. White.

ulentoides n. s. Lea. (1868.)
ad. Nat. Sci., Phila., for 1868, p. 164. Phila.,
Isaac Lea.
on: Cretaceous.
: About six miles northeast of Camden,
ersey.

ulentoides (Lea.) Whitfield.

. S. Geol. Sur., vol. 9, p. 252, pl. 35,
Wash., 1885. R. P. Whitfield.
on: Cretaceous.
: Fish house, Camden county, New
.

dioides n. s. Lea. (1868.)
cad. Nat. Sci., Phila., for 1868, p. 164.
, 1868. Isaac Lea.
on: Cretaceous.
: About six miles northeast of Camden,
ersey.

Anodonta—Continued.

—— **grandoides (Lea) Whitfield. (1885.)**
Mon. U. S. Geol. Sur., vol. 8, pp. 251–252, pl. 35, figs. 2, 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, New Jersey.

—— **parallela n. s. White. (1878.)**
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 709. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colorado, about ten miles above the confluence of the creek with South Platte river.

—— **parallela White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 168. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colorado.

—— **parallela White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 62, pl. 24, fig. 3*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colorado.

—— **parallela White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 23, pl. 19, fig. 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colorado.

—— **parallela ? (White) Whiteaves. (1885.)**
Geol. and Nat. Hist. Sur. Can. Cont. Can. Paleont. vol. 1, pt. 1, p. 64. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, one mile below the mouth of Bow river, Canada.

—— **propatoris n. s. White. (1877.)**
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. 3, p. 601. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Dog creek, and also upon the north side of the Missouri river, near Birch creek, Montana.

—— **propatoris White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 23, pl. 19, figs. 6–9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **propatoris White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 61–62, pl. 24, figs. 2*a–d*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Dog creek, and also upon the north side of the upper Missouri river, near Birch creek, Montana.

Anodonta—Continued.

—— **propatoris?** (White) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can. Cont. Can. Paleont., vol. 1, pt. 1, pp. 58–59, pl. 9, figs. 2, 2a. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Forty-ninth parallel, six miles west of the first or south branch of the Milk river; Big Island bend, on the Belly river; Milk River ridge; South Saskatchewan, eight miles above the mouth of the Red Deer river; Red Deer river, township 21, range 12, west of 4th principal meridian; near Bull's Head, Canada.

Anomia (Linn.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 284. New Haven, 1830. S. G. Morton.

—— **andersonii** n. s. M. & V. (1878.)

Proc. Acad. Nat. Sci., Phila., pt. 2, for 1878, p. 272, figs. 1 and 2. Phila., 1878. Mazyck & Vogdes.
Formation: Cretaceous.
Location: Artesian well on the Citadel Green, Charleston, S. C., between 1,880 and 1,930 feet below the surface.

—— **argentaria** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol 23, p. 293, pl. 5, fig. 10. New Haven, 1833. S. G. Morton.
Formation: Ferruginous sand. [Cretaceous.]
Location: New Jersey.

—— **argentaria** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 61, pl. 5, fig. 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: St. Georges, Delaware.

—— **argentaria** (Morton) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., 1876, pp. 319, 320. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Georgia.

—— **argentaria** (Mort.) Whitfield. (1884.)

Mon. U. S. Geol. Sur., vol. 9, p. 42, pl. 4, figs. 9–11. Wash., 1885. R. P. Whitfield.
Location: Freehold, N. J.

—— **concentrica** n. s. Meek. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, pp. 311–312. Phila., 1861. F. B. Meek.
Formation: Cretaceous.
Location: Near Bear river, on Sulphur creek, lat. 41° 12′, long. 110° 50′.

—— **concentrica** Meek. (1876.)

Rep. Expl. Great Basin Terr. Utah, p. 359, pl. 4, fig. 3. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Bear river, near the mouth of Sulphur creek, Wyoming.

—— **ephippium** ? (Lam.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, pp. 284, 285. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand. [Cretaceous.]
Location: St. Georges, Del., and other places in the vicinity. Near Arneytown, N. J.

Anomia—Continued.

—— **flemingi** n. s. Meek. (1859.)

N. W. Terr. Rep. Prog. Assin. and Saskat. Exp Exped., H. Y. Hind, p. 183, pl. 1, figs. 2, 3. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: Little Souris river, Canada.

—— ? **gryphorhynchus** n. s. Meek. (1872.)

Fifth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 375–376. Wash., 1872. F. B. Meek
Formation: Cretaceous.
Location: Point of Rocks, Wyoming.

—— **gryphorhynchus** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur Terr., pp. 166–167. Wash., 1879. C. A. Whit
Formation: Cretaceous.
Location: Crow creek valley, Colorado.

—— **gryphorhynchus** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 208. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley, near Cañon park, Colorado.

—— **gryphorhynchus** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bitter creek valley, two miles west of Point of Rocks station, Wyoming.

—— **gryphorhynchus** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 217. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Two miles below Point of Rocks; Crow creek; Black buttes, Wyoming; Yampa valley near Cañon park, Colorado.

—— **gryphorhynchus** (Meek) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 57, pl. 25, figs. 1a–c. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Two miles below Point of Rocks, Wyoming.

—— **gryphorhynchus** (Meek) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 16, pl. 12, figs. 12–15. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Colorado and Wyoming.

—— **lineata** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 203–204, pl. 26, fig. 193. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Pence's ranch, Chico creek, etc., California.

Anomia—Continued.

—— **linifera** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 2, pl. 1, fig. 1. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— **lintea** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 2. T. A. Conrad.
Formation: Cretaceous.
Location: The Barn, Cape Fear river, North Carolina.

—— **micronema** n. s. Meek. (1875.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 1, No. 1, 2d ser. p. 43. Wash., 1875. F. B. Meek.
Formation: Cretaceous.
Location: Two hundred miles east of Denver, Colorado.

—— **micronema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 165–166. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location; Crow creek valley, Colorado.

—— **micronema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Bijou creek, Colorado.

—— **micronema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 208. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley, near Cañon park, Colorado.

—— **micronema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 211. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colorado.

—— **micronema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Rock Springs, Wyoming.

—— **micronema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 217. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black buttes and Rock Springs, Wyoming.

—— **micronema** (Meek) White (under valve.) (1882.)
Proc. U. S. Nat. Mus., vol. 5, pp. 97–98, pl. 3, fig. 3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Northeastern Colorado.

Anomia—Continued.

—— **micronema** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 57–58, pl. 25, figs. 2*a*–*d*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: From a shaft sunk on the Kansas Pacific railroad, two hundred miles east of Denver, Colo., 45 feet below the surface.

—— **micronema** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 16, pl. 12, figs. 6–11. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Northeastern Colorado.

—— **micronema** (Meek) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur., Can. Cont. Can. Paleont., vol. 1, pt. 1, p. 64. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, half a mile below the forks of the Bow and Belly rivers, Canada.

—— **nitida** n. s. Meek. (1876.)
Rep. Expl. Exped., Santa Fé, New Mexico, to junction of Grand and Green rivers, p. 125, pl. 1, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Pope's Well.

—— **obliqua** n. s. (M. & H.) (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 181. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Near mouth of Niobrara river, Nebraska.

—— ? **obliqua** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 22, pl. 9, fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the mouth of the Niobrara river, on the Missouri.

—— **obliqua** (M. & H.) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur., Can. Cont. Can. Paleont., vol. 1, pt. 2, p. 187. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Vermilion river, township 24, range 20 w.; and Ochre river, township 22, range 17 w. Manitoba.

—— **perstrigosa** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur., Can.; Cont. Can. Paleont., vol. 1, pt. 1, pp. 4–5, pl. 1, fig. 2. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Upper Belly river, 23 miles above the mouth of the Waterton. St. Mary's river series, Canada.

—— **propatoris** n. s White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 14–15, pl. 12, figs. 15*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Anomia—Continued.

—— **propatoris** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 16, pl. 5, figs. 6, 7. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **raetiformis** n. s Meek. (1877.)

Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, p. 141, fig. 1. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Ridge southeast of Laporte, Colorado territory.

—— **sellæformis** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser. 1855–1858, p. 330, pl. 34, fig. 6. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **semiglobosa** (Gein.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 231–232. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Woodbury and Haddonfield, New Jersey.

—— **subtrigonalis** n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 181. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Bijou hill, Nebraska.

—— ? **subtrigonalis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 22–23, pl. 16, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Bijou hill, on the Missouri.

—— **tellinoides** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 294, pl. 5, fig. 11. New Haven, 1833. S. G. Morton.
Formation: Ferruginous sand (Cretaceous).
Location: New Jersey.

—— **tellinoides** Morton. (1834.)

Synop. Org. Rem. Cret. Gr., U. S. p. 61, pl. 5, fig. 11, Phil., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey, etc.

—— **tellinoides** (Mort.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 43, pl. 4, figs. 12, 13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel and Freehold, New Jersey.

—— **truncata** (Gein.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges. Band 22, p. 232. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Woodbury and Haddonfield, New Jersey.

—— **vancouverensis** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 202, pl. 33, fig. 102 Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Departure bay, near Nanaimo, Vancouver island.

Anomia—Continued.

—— **vancouverensis** (Gabb) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 175–177, pl. 20, figs. 5, 5*a*–*d*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Banks of the Trent river, Vancouver island, above the falls.

—— **vancouverensis** (Gabb) White. (1889.)

Bull. U. S. Geol. Sur. No. 51, p. 36. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Waldron island.

—— (**Placunopsis** ?) **gryphorhynchus** Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 509–511. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Two miles below Point of Rocks, Wyoming.

—— ? White. (1878).

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— sp. undet. Hill. (1888.)

Ann. Rep. Geol. Sur. Arkansas for 1888, vol. 2, p. 135. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous?
Location: Arkansas.

Anthonya n. g. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 181–182. Phila., 1864. W. M. Gabb.

—— **cultriformis** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 182, pl. 30, figs. 236, 236*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

Anthophyllum (Schweigg.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.

—— **atlanticum** n. s. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand (Cretaceous).
Location: Gloucester county, New Jersey.

—— **atlanticum** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pl. 1, figs. 9, 10. New Haven, 1830. S. G. Morton.

—— **atlanticum** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 80, pl. 1, figs. 9, 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester county, New Jersey.

—— Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 123–124. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.

ıa n. g. Conrad. (1868.)
ır. Conch, vol. 4, p. 246. Phila., 1868.
I. Gabb.

gen. Conrad.) Meek. (1876.)
S. Geol. Sur. Terr., vol. 9, p. 179.
, 1876. F. B. Meek.

. n. s. Conrad. (1875.)
ol. Sur. N. Carolina, vol. 1. Raleigh,
W. C. Kerr. App. A, pp. 7–8, pl. 2, fig.
A. Conrad.
ɔn : Cretaceous.
: Snow hill, Greene county, North Caro-

ına (Conrad sp.) Conrad.

ır. Conch. vol. 4, p. 246, pl. 18, fig. 5.
, 1868. T. A. Conrad.
ɔn : Cretaceous.

ına (Con.) Whitfield. (1885.)
S. Geol. Sur., vol. 9, pp. 154–155, pl.
. 6, 7. Wash., 1885. R. P. Whitfield.
ɔn : Cretaceous.
: Deep cut of the Holmdel and Keyport
ke, Monmouth county, and at Rev. G. C.
k's pits, Marlborough, and from Cream
New Jersey.

s (Petiver) Conrad. (1858.)
ad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–
. 330. Phila., 1855–1858. T. A. Conrad.

w.) Gabb. (1876.)
ad. Nat. Sci., Phila., for 1876, p. 299.
1876. Wm. M. Gabb.

wyn typical) Meek. (1876.)
S. Geol. Sur. Terr., vol. 9, p. 320.
1876. F. B. Meek.

wyn) Meek. (1876.)
S. Geol. Sur. Terr., vol. 9, pp. 320–322.
1876. F. B. Meek.

lata n. s. Gabb. (1864.)
r. Cal., Paleont., vol. 1, p. 128, pl. 20,
Phila., 1864. W. M. Gabb.
n : Cretaceous.
: Bull's Head point, near Martinez, Cal.

gulata (M. & H.) Meek.

. Geol. Sur. Terr., vol. 9, pp. 322–323,
figs. 6*a*–*c*, fig. 37, p. 322. Wash., 1876.
Ieek.
n : Cretaceous.
: Yellowstone river, one hundred and
les from its mouth.

arinata n. s. Gabb. (1876.)
ad. Nat. Sci. Phila., for 1876, pp. 299–
hila., 1867. Wm. M. Gabb.
n : Cretaceous.
: Pataula creek, Georgia.

rnica n. s. Gabb. (1864.)
. Cal., Paleont., vol. 1, pp. 128–129, pl.
230*a*, *b*. Phila, 1864. W. M. Gabb.
n : Cretaceous.
: Orestimba cañon; Martinez; Puerto
Stanislaus county; Siskiyou mountain,
ia.

Aporrhais—Continued.

—— **decemlirata** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, pp. 330–331, pl. 35, fig. 11. Phila., 1855–1858. T. A. Conrad.
Formation : Cretaceous.
Location : Owl creek, three miles north of the town of Ripley, Miss.

—— **exilis** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 129, pl. 29, fig. 231. Phila, 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Martinez, Cal.

—— **falciformis** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1. pp. 127–128, pl. 20, fig. 83. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Tuscan springs; Chico creek; Pence's ranch, Butte county; Texas Flat, Placer county, California.

—— **meeki** n. s. Whitfield. (1877.)

U. S. Geogr. and Geol. Sur. Rocky Mt. region; Prelim. Rep. Paleont. Black hills, p. 37. Wash., 1877. R. P. Whitfield.
Form : Cretaceous.
Location : On the Cheyenne river near Rapid creek, Black hills, Dakota.

—— **meeki** Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, p. 426, pl. 12, fig. 5. Wash., 1880. R. P. Whitfield.
Formation : Cretaceous.
Location : On the Cheyenne river near Rapid creek, Black hills.

—— **newberryi** (Meek). Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, pp. 425–426, pl. 12, fig. 4. Wash., 1880. R. P. Whitfield.
Formation : Cretaceous.
Location : On the Rio de la Plata.

—— **parva** n. s. (M. & H.) (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 178. Phila., 1861. Meek & Hayden.
Formation : Cretaceous.
Location : Yellowstone river, one hundred and fifty miles above the mouth, Nebraska.

—— **sublevis** n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 178. Phila., 1861. Meek & Hayden.
Formation : Cretaceous.
Location : Yellowstone river, Nebraska.

—— (**Goniocheila**) **castorensis** n. s. Whitfield. (1877.)

U. S. Geogr. and Geol. Sur. Rocky Mt. region; Prelim. Rep. Paleont. Black hills, p. 38. Wash., 1877. R. P. Whitfield.
Formation : Cretaceous.
Location : On the east fork of Beaver creek, Black hills.

—— (**Goniocheila**) **castorensis** Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, p. 427, pl. 12, fig. 1. Wash., 1880. R. P. Whitfield.
Formation : Cretaceous.
Location : East fork of Beaver creek, Black hills.

Aporrhais—Continued.

—— **sp. undet.** Whiteaves. (1874.)
Geol Sur. Can. Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-fourth and two and one-half miles up.

Aptychus (Meyer) Barcena. (1877.)
An. Museo. Nac. Mex., tomo, 1, pp. 89, 90. Mexico, 1877–1879. M. Barcena.

—— **arenasii** Barcena. (1877.)
An. Museo. Nac. Mex. tomo 1, pp. 90, 91, figs. 4–6. Mexico, 1877–1879. M. Barcena.
Formation: Mesozoic.
Location: Peñon Blanco mountains, San Luis Potosi, Mexico.

Arbacia sp. undet. Roemer. (1849.)
Texas, p. 392. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: New Braunfels, Texas.

Arca [Linn.] Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 45. New Haven, 1820. Thomas Say.
Formation: Alluvium (Cretaceous).
Location: New Jersey.

—— **altirostris** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 325. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, New Jersey.

—— **altirostris** (Gabb) Whitfield. (1885.)
Mong. U. S. Geol. Survey, vol. 9, pp. 82–83, pl. 12, figs. 22, 23. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Crosswicks? New Jersey.

—— **breweriana** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 193–194, pl. 25, fig. 181. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county; Tuscan Springs, Tehama county, Cal.

—— ? **coalvillensis** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 115–116. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **decurtata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 195, pl. 31. figs. 265, 265a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Rag Cañon, Napa county, California.

—— **equilateralis** n. s. Meek. (1858.)
Trans. Albany Inst., vol. 4, pp. 39, 40. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— ? **equilateralis** (Meek sp.) Meek. (1876.)
Bull. U. S. Geol. and Geog. Sur. Terr., vol. 2, No. 4, p. 357, pl. 2, figs. 6, 6a. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo?, Vancouver island.

Arca—Continued.

—— **exaltata** (Nils.) Credner. (1870.)
Zeitsch. Deutsch Geol. Ges. Band., 22, p. 233. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **glabra** (Sow.) Credner. (1870.)
Zeitsch. Deutsch Geol. Ges. Band. 22, p. 233. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Tinton Falls and Blockwoodtown, New Jersey.

—— **gratiota** n. s. Hill. (1888.)
Ann. Rep. Geol. Sur. Ark., for 1888, vol. 2, p. 133, pl. 4, figs. 2, 2a. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous (?).
Location: Upper part of gypsum bluffs of the Little Missouri river, Arkansas.

—— **gravida** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 194–195 pl. 30, fig, 264. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Rag Cañon, Napa county, San Luis Gonzaga ranch, Pacheco's pass, Cal.

—— **hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 194, pl. 30, fig. 263. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, California.

—— **ligeriensis** (d'Orb.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 233–234. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Tinton Falls, Eatontown, Blackwoodtown, New Jersey.

—— ? **parallela** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 303–304. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

—— **proutiana** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 601–602. St. Louis, 1856–1860. B. F. Shumard,
Formation: Cretaceous.
Location: Comanche peak and Parker county, near the Brazos river, Texas.

—— **quindecemradiata** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 95, pl. 2, fig. 1. Phila., 1861. Wm. M. Gabb.
Formation: Cretaceous.
Location: Northerly portions of New Jersey.

—— **quindecimradiata** (Gabb) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 208, pl. 27, figs. 10–13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near New Egypt, New Jersey.

Arca—Continued.

—— **rostellata** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 64, pl. 3, fig. 11. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Alabama.

—— **saffordii** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 397, pl. 68, fig. 37. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tennessee.

—— **subelongata** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 148, pl. 6, figs. 3*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between El Paso and Frontera.

—— **sulcatina** n. s. E. & S. (1857.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 39. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Woods fork, three miles from Grand river.

—— **trapezoidea** (Gein.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band. 22, p. 234. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville, New Jersey.

—— **uniopsis** n. s. Conrad. (1853.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275, pl. 24, fig. 17. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Burlington county, New Jersey.

—— **vancouverensis** n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, p. 40. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver Island.

—— (**Barbatia**) **parva-missouriensis** n. s. Hill. (1888.)

Ann. Rep. Geol. Sur. Arkansas for 1888, vol. 2, p. 133, pl. 4, figs. 5, 4*a*, 4*b*, pl. 2, fig. 22. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous (?).
Location: Arkansas.

—— (**Cucullæa**) **cordata** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 86. Phila., 1857. Meek & Hayden.
Formation; Cretaceous.
Location: Moreau trading post, Nebraska.

—— (**Cucullæa**) **inornata** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 51. Phila., 1859. Meek & Hayden.
Formation: Jurassic.
Location: Southwestern base of Black hills; also, around Bear butte, on east side of Black hills.

—— (**Cucullæa**) **shumardi** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 86. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, Nebraska.

Arca—Continued.

—— (?**Macrodon**) **eufalensis** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 398, pl. 68, fig. 38. Phila. 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Alabama.

—— sp. undet. Roemer. (1849.)

Texas, p. 404. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Texas.

—— sp. undet. Roemer. (1849.)

Texas, p. 404. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford, near New Braunfels, Texas.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 53. Bonn, 1851. F. Roemer.
Formation : Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 53. Bonn, 1852. F. Roemer.
Formation : Cretaceous.
Location : Ford of the Guadalupe, New Braunfels, Texas.

—— ——. Whiteaves. (1882.)

Proc. and Trans. Roy. Soc., Canada, vol. 1, sec. 4, p. 85. Montreal, 1883. J. F. Whiteaves.
Formation : Cretaceous.
Location : North slope of Jackass mountain, Canada.

Arcestes (Suess) Hyatt. (1877.)

Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, pp. 119–120. Wash., 1877. Alpheus Hyatt.

—— ? **cirratus** n. s. White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 6, pp. 116–117. Wash., 1880. C. A. White.
Formation : Jura-Trias. [Triassic.]
Location : Locality No. 1, southeastern Idaho.

—— **cirratus** White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 116 117. Wash., 1883. C. A. White.
Formation : Triassic.
Location : Locality No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Gray's lake.

—— **gabbi** n. s. Meek. (1877.)

Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, pp. 121–123, pl. 10, figs. 6*a*, *b*. Wash., 1877. F. B. Meek.
Formation : Triassic.
Location : West Humboldt range, near Cottonwood canyon, Nevada.

—— **gabbi** (Meek) Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser., 1886. App. 1, p. 110 B. Montreal, 1887. J. F. Whiteaves.
Formation : Triassic.
Location: Bay five and one-half miles west of Cape Commerell, north end of Vancouver island.

Arcestes—Continued.

—— **gabbi** (Meek) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can.; Paleont., vol. 1, pt. 2, p. 141. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Bay five and one-half miles west of Cape Commerell, north end of Vancouver island.

—— ? **perplanus** n. s. Meek. (1877.)
Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, pp. 120–221, pl. 11, figs. 7, 7*a*. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Buena Vista canyon, south fork, West Humboldt range.

—— ? White. (1880.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, p. 117. Wash., 1880. C. A. White.
Formation: Jura-Trias. (Triassic.)
Location: Locality No. 1, southeastern Idaho.

—— ? White. (1880.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, p. 117. Wash., 1880. C. A. White.
Formation: Jura-Trias. (Triassic.)
Location: Locality No. 1, southeastern Idaho.

—— ? White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 117–118. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Gray's lake.

Archæoplax n. g. Stimpson. (1863.)
Bost. Jour. Nat. Hist., vol. 7, 1859–1863, p. 584. Boston, 1863. William Stimpson.

—— **signifera** n. s. Stimpson. (1863.)
Bost. Jour. Nat. Hist., vol. 7, 1859–1863, pp. 584–589, pl. 12, figs. 1–4. Boston, 1863. William Stimpson.
Formation: Cretaceous.
Location: Gay head, the southwestern extremity of Marthas Vineyard.

Architectonica (Bolt.) Gabb. (1861.)
Proc. Acad. Nat. Sci. Phila., for 1861, p. 321. Phila., 1862. Wm. M. Gabb.

—— **abbottii** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 321–322. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill and Timber creek, New Jersey; Prairie Bluff, Alabama.

—— **cognata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 117, pl. 20, fig. 72, 72*a–e*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Seven miles south of Martinez, near Clayton; Bull's Head point, near Martinez, Cal.

Architectonica—Continued.

—— **hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 117–118, pl. 20, figs. 224, 224*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

—— **inornata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 118, pl. 20, fig. 73. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Southwest of Martinez; Tuscan Springs, Tehama county, Cal.

—— **veatchii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 116–117, pl. 19, fig. 71. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

Arcomya (Ag.) Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 179. Phila., 1869. W. M. Gabb.

—— **crassissima** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halb. Mang. Aleut. Inseln., p. 127. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **undulata** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 179, pl., 29, fig. 67. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Indian creek, Butte county, Cal.

Arcopagella n. g. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 308–309. Wash., 1871. F. B. Meek.

—— ? **macrodonta** n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 202–203, pl. 1, fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Big Sioux river, three miles above its mouth.

—— **mactroides** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 309–310, figs. A. & B. text. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

—— **mactroides** (Meek) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 202, pl. 2, figs. 4*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

Arcopagia (Leach) Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pl. 2, p. 149. Wash., 1857. T. A. Conrad.

—— **concentrica** (d'Orb.) Eichwald.
Geog.-Paleont. Bemerk. Halb. Mang. Aleutischen Inseln., p. 171, Taf. 16, figs. 17, 18. St. Petersburg., 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

;ia—Continued.

nismalis (d'Orb.) Eichwald.
871.)
ıleont. Bermerk. Halb. Mang., Aleutischen
ı., pp. 122-123. St. Petersburg, 1871. E.
rald.
ion : Cretaceous.
n : Kadiak island, Alaska.

ına n. s. Roemer. (1852.)
von Texas, pp. 46–47, Taf. 6, figs. 8*a*, *b*.
1852. F. Roemer.
on : Cretaceous.
ı : Fredericksburg, Texas.

.na (Roem.) Conrad. (1857.)
S. and Mex. Bound. Sur., vol. 1, pt. 2,
pl. 4, figs. 3*a*, *b*. Wash., 1857. T. A.
d.
on : Cretaceous.
ı : Leon springs, Texas.

ıa n. g. Conrad. (1875.)
ol. Sur. N. Carolina, vol. 1. Raleigh,
W. C. Kerr, App. A, p. 5. T. A. Conrad.

linensis n. s. Conrad. (1875.)
ol. Sur. N. Carolina, vol. 1. Raleigh,
W. C. Kerr., App. A, p. 5, pl. 1, fig. 6.
Conrad.
n : Cretaceous.
: Snow hill, Greene county, North
ıa.

g. Conrad. (1875.)
l. Sur. N. Carolina, vol. 1. Raleigh,
V. C. Kerr. App. A., p. 6. T. A. Conrad.

inensis n. s. Conrad. (1875.)
l. Sur. N. Carolina, vol. 1. Raleigh,
W. C. Kerr. App. A., pp. 6–7, pl. 2, fig.
A. Conrad.
n : Cretaceous.
: Snow hill, Greene county, North Car-

s n. g. Hyatt. (1889.)
s. Comp. Zool., vol. 16, pp. 161-162.
lge, 1889. A. Hyatt.

oldti n. s. Hyatt. (1889.)
ıs. Comp. Zool., vol. 16, pp. 173–174,
33. Cambridge, 1879. A. Hyatt.
ı : Jurassic.
Humboldt county, Nevada.

adanum (Gabb sp.) Hyatt.
.)
s. Comp. Zool., vol. 16, pp. 172-173.
ge, 1889. A. Hyatt.
: Lower Lias? [Jurassic?]
Near Volcano, in Nevada.

n. g. ms. (Hyatt) Whiteaves.

Nat. Hist. Sur. Can., Cont. Can.
, vol. 1, pt. 2, pp. 144–145. Montreal,

uverensis Whiteaves. (1889.)
Nat. Hist. Sur. Can., Cont. Can. Paleont.,
. 2, p. 146. pl. 19, fig. 2. Montreal, 1889.
ıiteaves.
: Triassic.
Three localities in the Queen Charlotte
at five on or near the north or north-
st of Vancouver island; at Hernandez
the Strait of Georgia.

Arrhoges (sub. gen. Gabb) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 321
Wash., 1876. F. B. Meek.

Artemis (Poli) Conrad. (1853.)
Proc. Acad. Nat. Sci., Phila., vol. 6, 1852-1853, p. 320. Phila., 1854. T. A. Conrad.

—— **excavata** (Mort. sp.) Conrad. (1853.)
Proc. Acad. Nat. Sci., Phila., vol. 6, 1852-1853, p. 320. Phila., 1854. T. A. Conrad.
Formation : Cretaceous.
Location : Arneytown, New Jersey.

Asaphis (Modeer) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 154. Phila. 1864. W. M. Gabb.

—— **multicostata** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 181, pl. 29, fig. 70. Phila., 1869. W. M. Gabb.
Formation : Cretaceous.
Location : Crooked creek of the Des Chutes river, Central Oregon, east of the Cascade mountains.

—— **undulata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 154, pl. 22, fig. 129. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Texas Flat, Placer county, Cal.

Aspidospira saxipara n. s. Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 38. Leipzig, 1854. C. G. Ehrenberg.
Formation : Cretaceous.
Location : Mississippi region.

Astacus (Lam.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.
Formation : Ferruginous sand [Cretaceous].
Location : Chesapeake and Delaware canal.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 74. Phila., 1834. S. G. Morton.
Formation : Cretaceous.
Location : Delaware.

Astarte (Sow.) Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850-1854, p. 276. Phila., 1850–1854. T. A. Conrad.

—— **annosa** n. s. Conrad. (1868.)
Am. Jour. Conch., vol. 4, p. 279, pl. 20, fig. 5. Phila., 1868. T. A. Conrad.
Formation : Triassic. [Cretaceous.]
Location : South river, New Jersey.

—— **appressa** n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, pp. 12-13, pl. 5, fig. 10. Phila., 1870. Wm. M. Gabb.
Formation : Jurassic.
Location : Volcano, about thirty miles southeast of Walker's lake, Nevada.

Astarte—Continued.

—— ? **arenosa** n. s. H. & W. (1877.)

Rep. Geol. Expl. 40th parallel, vol. 4, pt. 2, pp. 297–298, pl. 7, figs. 20, 21. Wash., 1877. Hall & Whitfield.
Formation: Jurassic ?
Location: North head of Chalk creek, Utah. Picked up in the débris, and of no stratigraphical importance.

—— **caelata** (Müll.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 236. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Woodbury, New Jersey.

—— **cardinioides** n. s. Whiteaves. (1874.)

Geol. Sur. Canada Rep. Prog. for 1873–1874, p. 267, pl. (?) fig. 3. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **cardinioides** Whiteaves. (1874.)

Geol. Sur. Canada Rep. Prog. for 1873–1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **carlottensis** n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Canada, Cont. Can. Paleont., vol. 1, pt. 2, pp. 154–155. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: East side of Alliford bay, Moresby island, Q. C. I., south side of Alliford bay; east end of Maud island, in Skidegate channel, Q. C. I.

—— **carlottensis** Whiteaves. (1889.)

Geol. and Nat. His. Sur. Canada, Cont. Can. Paleont., vol. 1, pt. 2, p. 168. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest territory.

—— **conradiana** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 178, pl. 24, fig. 161. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas Flat, Placer county, Cal.

—— **conradiana** (Gabb) Whiteaves. (1879.)

Geol. Sur. Canada Mes. Foss., vol. 1, pt. 2, p. 160, pl. 18, fig. 5, 5*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **conradiana** var. **tuscana** (Gabb.) Whiteaves. (1879.)

Geol. Sur. Canada, Mes. Foss., vol. 1, pt. 2, pp. 160–161, pl. 18, fig. 6. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island; Sucia islands.

Astarte—Continued.

—— **corbicula** n. s. Conrad. (1867.)

Amer. Jour. Conch., vol. 3, p. 12. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, New Jersey.

—— **crenalirata** n s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 282–283, pl. 46, fig. 25. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Alabama.

—— **evansi** (H. & M.) Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, p 413, pl. 11, fig. 13. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek, Black hills.

—— **fragilis** n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 183. Phila., 1861. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills, Nebraska.

—— **fragilis** M. & H. (1865.)

Paleont. upper Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 94, pl. 4, fig. 7. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— **fragilis** (M. & H.) Whiteaves. (1878.)

Canadian Naturalist, vol. 8, n. ser., No. 7, pp. 405–406. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— **fragilis** (M. &. H.) Whiteaves. (1878.)

Geol. Sur. Canada, Rep. Prog. for 1876–1877, p. 155. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— ? **fragilis** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black hills of Dakota, pp. 363–364, pl. 5, figs. 32, 33. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater valley, Black hills.

—— **germani** (Pict. et Camp.) Eichwald. (1871.)

Geog.-Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, p. 177, Taf. 15, fig. 13. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: South shore of Tukusitua bay and west shore of Kenai bay, Alaska.

—— **gregaria** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 84. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, Nebraska.

-Continued.

nata n. s. M. & H. (1860.)
cad. Nat. Sci., Phila., for 1860, p. 183.
, 1861. Meek & Hayden.
on : Jurassic.
ı : Southwest base of Black hills, Ne-
ı.

ıata M. & H. (1865.)
upper Missouri; Smithson. Cont.
., vol. 14, No. 172, p. 94, pl. 3, figs. 12,
Wash., 1865. Meek & Hayden.
ɔn : Jurassic.
: Southwest base of the Black hills.

s n. s. Eichwald. (1871.)
leont. Bemerk. Halb. Mang. Aleutischen
p. 178, Taf. 16, fig. 27. St. Petersburg,
E. Eichwald.
n : Cretaceous.
: Alaska.

.ata n. s. Roemer. (1849.)
ł04. Bonn, 1849. Roemer.
ı : Cretaceous.
Ford near New Braunfels, Tex.

ata Roemer. (1852.)
ɔn Texas, p. 51, Taf. 7, figs. 8*a*–*c*. Bonn,
'. Roemer.
ı : Cretaceous.
Ford of the Guadalupe, New Braunfels,

ɪwsonii n. s. Gabb. (1864.)
Cal., Paleont., vol. 1, p. 179, pl. 30, fig.
ila., 1864. W. M. Gabb.
: Cretaceous.
Near Martinez, California.

:ata n. s. Gabb. (1860.)
l. Nat. Sci., Phila., vol. 4, 2d ser. 1858-
394–395, pl. 68, fig. 27. Phila., 1858–1860.
Gabb.
: Cretaceous.
Eufaula, Alabama.

rdi n. s. White. (1880.)
ın. Rep. U. S. Geol. and Geogr. Sur.
1, p. 149, pl. 37, figs. 6*a*, *b*. Wash.,
A. White.
: Jurassic.
Near Como station, Wyoming.

:di (White) Whiteaves. (1884.)
at. Hist. Sur. Can. Mes. Foss., vol. 1, pt.
-230, pl. 30, figs. 6, 6*a*, *b*. Montreal,
F. Whiteaves.
Cretaceous.
East side of Alliford bay; south side
l bay; east end of Maud island.

·di (White) Whiteaves. (1887.)
fat. Hist. Sur. Can., vol. 2, n. ser, 1886.
112 *B*. Montreal, 1887. J. F. Whit-

Cretaceous.
:ast side of Winter harbor, Forward

Astarte—Continued.

—— **parilis** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 276, pl. 24, fig. 16. Phila., 1850-1854. T. A. Conrad.
Formation : Cretaceous.
Location : Monmouth county, New Jersey.

—— **paulina** n. s. Eichwald. (1871.)
Geog. Paleont. Bemork. Halb. Maug. Aleutischen Inseln., p. 133. St. Petersburg, 1871. E. Eichwald.
Formation : Cretaceous.
Location : St. Paul island, Alaska.

—— ? **staminea** n. s. Conrad. (1870.)
Am. Jour. Conch., vol. 6. Phila., 1870–1871, p. 73 Phila., 1871. T. A. Conrad.
Formation : Cretaceous.
Location : Ripley Co., Miss. [Ripley, Tippah Co., Miss.]

—— **texana** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 152, pl. 5, fig. 9. Wash., 1857. T. A. Conrad.
Formation : Cretaceous.
Location : Western Texas.

—— **thomasii** n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 267. Phila., 1856. T. A. Conrad.
Formation : Miocene [Cretaceous?].
Location : Near Mullica hill, New Jersey.

—— **tuscana** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 179, pl. 30, fig. 257. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Tuscan Springs; Pence's ranch, Butte county, California.

—— **vancouverensis** n. s. Whiteaves. (1874.)
Geol. Sur. Canada, Rep. Prog. for 1873–1874, pp. 267–268, pl. [not numbered], fig. 4. Montreall 1874. J. F. Whiteaves.
Formation : Cretaceous.
Location : Northwest bay, Vancouver island: coast a little west of Northwest bay.

—— **vancouverensis** Whiteaves. (1874.)
Geol. Sur. Canada, Rep. Prog. for 1873–1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation : Cretaceous.
Location : Northwest bay, Vancouver island.

—— **ventricosa** n. s. Meek. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 50, pl. 8, figs. 5, 5*a*. Phila., 1864. F. B. Meek.
Formation : Jurassic.
Location : Genessee valley, Plumas county, Cal.

—— **ventricosa** (Meek) Whiteaves. (1878.)
Geol. Sur. Canada, Rep. Prog. for 1876–1877, p. 155. Montreal, 1878. J. F. Whiteaves.
Formation : Jurassic.
Location : Iltasyouco river, British Columbia

—— **ventricosa** (Meek) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 405 Montreal, 1878. J. F. Whiteaves.
Formation : Jurassic.
Location : Iltasyouco river.

Astarte—Continued.

—— **veta** n. s. Conrad. (1868.)
Am. Jour. Conch., vol. 4, p. 279, pl. 20, fig. 4. Phila., 1868. T. A. Conrad.
Formation: Triassic [Cretaceous].
Location: South River, New Jersey.

—— **veta** (Con.) Whitfield. (1884.)
Mon. U. S. Geol. Sur., vol. 5, pp. 23–24, pl. 2, fig. 1. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near Washington, Middlesex county, New Jersey.

—— **washitensis** n. s. Shumard. (1853.)
Expl. Red river, Louisiana, by R. B. Marcy, pp. 206–207, pl. 3, fig. 3. Wash., 1864. B. F. Shumard.
Formation: Cretaceous.
Location: Camp No. 4, Cross Timbers, Texas.

—— **sp. undet.** Urquiza. (1882.)
An. Min. Fomento Rep. Mex., tomo 7, p. 224, fig. 14. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Dolores mine, Coalcoman district, state of Michoacan, Mexico.
(=A. minima in list).

—— ? Lyell. (1847.)
Quart. Jour. Geol. Soc., Lond., vol. 3, p. 275, fig. 6b. London, 1847. C. Lyell.
Formation: Jurassic? (Triassic?)
Location: Near Blackheath, Virginia.

Asterias [Linn.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 74. Phila., 1834. S. G. Morton.

—— ? **dubium** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. region, Prel. Rep. Paleont. Black hills, p. 15. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: Park sands seventy feet above the red beds, on the east side of Spearfish creek, near its junction with the Redwater, northeast of Crow peak, Black hills, Dakota.

—— ? **dubium** Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 344–345, pl. 3, fig. 3. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: On the east of Spearfish creek, near its junction with the Redwater, Black hills, Dakota.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 74. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: South Carolina.

Astrea cretacea n. s. Bölsche. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 216–217. Berlin, 1870. Wilh. Bölsche.
Formation: Cretaceous.
Location: Woodbury and Haddonfield, New Jersey.

Astrocœnia (E. & H.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 208. Phila., 1864. W. M. Gabb.

Astrocœnia—Continued.

—— **guadalupæ** n. s. Roemer. (1849.)
Texas, pp. 391–392. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Hill north of New Braunfels, Texas.

—— **guadalupæ** Roemer. (1852.)
Kreide. von Texas, p. 87, Taf. 10, figs. 8, a. b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Left bank of Comal creek, near New Braunfels, Texas.

—— **irregularis** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol 1, pt. 3, p. 246, pl. 33, fig. 1. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island, Skidegate channel, west of Alliford bay.

—— ? **petrosa** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 208, pl. 31, figs. 274. 274*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: One mile west of Martinez, California.

Ataphrus n. g. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 171. Phila., 1869. W. M. Gabb.

—— **compactus** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 303. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: North Carolina.

—— **crassus** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 171, pl. 28, fig. 54. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, California.

—— **kerri** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 303–304, pl. 17, fig. 10. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: North Carolina.

Athleta n. sub. gen. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser. 1856–1860, p. 292. Phila., 1856–1860. T. A. Conrad.

Atresius n. g. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 168–169. Phila., 1869. W. M. Gabb.

—— **liratus** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 169, pl. 28, fig. 50. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Colusa county, southeast of the Hot Sulphur Springs, California.

Aturia (Bronn) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 59. Phila., 1864. W. M. Gabb.

—— **mathewsonii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 59–60, pl. 17, fig. 31. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez and Clayton (Div. A), and Cañada de las Uvas (Div. B Cal.)

—Continued.

athewsonii (Gabb) Conrad.
)
ur. Conch. vol. 3, p. 6. Phila., 1867. T.
onrad.
tion: Cretaceous.
n: California.

(Keyserling) Meek. (1865.)
Sur. Cal., Geology, vol. 1, p. 479. Phila.,
F. B. Meek.

centrica (Fisch.) Eichwald.

aleont., Bemerk. Halb. Mang. Aleutischen
n, pp. 186–187, Taf. 17, figs. 1, 2. St. Peters-
, 1871. E. Eichwald.
tion: Cretaceous.
n: Kenai bay, Alaska.

centrica (Keyserling) Toula.

veite Deutsche Nordpolarfahrt. Zweiter
. p. 503. Leipzig, 1874. Franz Toula.
ion: Jurassic [Cretaceous ?].
n: Kuhn island, east coast of Greenland.

centrica Fischer. (1875.)
a la côte Nord-Ouest de l'Amérique, pp.
pl. a, figs. 4–6, par. Alph. L. Pinart,
1875. P. Fischer.
on: Jurassic [Cretaceous ?].
n: Alaska.

entrica White. (1888.)
. S. Geol. Sur. vol. 13, pp. 226–232, pl. 4,
1–15. Wash., 1888. C. A. White.
on: Cretaceous.
n: Fossil Point, Port Möller, Alaska.

entrica White. (1888.)
S. Geol. Sur. vol. 13, pp. 226–232, pl. 4,
6–20. Wash., 1888. C. A. White.
on: Cretaceous.
: Near Knoxville, California.

entrica White. (1889.)
S. Geol. Sur. vol. 13, pp. 226–232, pl. 4,
Wash., 1888. C. A. White.
n: Cretaceous.
: Washington.

entrica var. crassicollis.
Toula. (1874.)
ite Deutsche Nordpolarfahrt. Zweiter
p. 504. Leipzig, 1874. Franz Toula.
n: Jurassic [Cretaceous ?].
: Kuhn island, east coast of Greenland.

entrica var. inflata n. var.
(1874.)
ite Deutsche Nordpolarfahrt. Zweiter
p. 504. Leipzig, 1874. Franz Toula.
n: Jurassic [Cretaceous ?].
: Kuhn island, east coast of Greenland.

entrica var. rugosa (Keys.)
(1874.)
ite Deutsche Nordpolarfahrt. Zweiter
pp. 503–504, Taf. 2, figs. 2*a*, *d*, and fig. 3.
, 1874. Franz Toula.
n: Jurassic [Cretaceous ?].
: Kuhn island, east coast of Greenland.

Aucella—Continued.

——concentrica var. rugosissima n. var. Toula. (1874.)
Die Zweite Deutsche Nordpolarfahrt. Zweite Band. p. 504, Taf. 2, fig. 4. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous ?].
Location: Kuhn island, east coast of Greenland.

—— concentrica var. sublaevis (Keys.) Toula. (1874.)
Die Zweite Deutsche Nordpolarfahrt. Zweiter Band, p. 504. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous ?].
Location: Kuhn island, east coast of Greenland.

—— concentrica Fischer (var.) White. (1884.)
Bull. U. S. Geol. Sur. No. 4, p. 13, pl. 6, figs. 2–12. Wash., 1884. C. A. White.

—— concentrica (Fischer) var. White. (1884.)
Bull. U. S. Geol. Sur. No. 4, pp. 13–14, pl. 6. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Fossil Point, Port Möller, Alaska.

—— erringtoni (Gabb sp.) Meek. (1865.)
Geol. Sur. Cal., Geology, vol. 1, pp. 479–480, pl. 1, figs. 2, 375, *a–d*. Phila., 1865. F. B. Meek.
Formation: Jurassic [Cretaceous ?].
Location: Mariposa estate, California.

—— erringtonii (Meek) White. (1888.)
Mon. U. S. Geol. Sur. vol. 13, pp. 226–232, pl. 4, figs. 6–10. Wash., 1888. C. A. White.
Formation: Cretaceous.

—— erringtoni var. linguiformis n. var. Meek. (1865.)
Geol. Sur. Cal., Geology, vol. 1, p. 481, pl. 1, figs. 1, 1*a*. Phila., 1865. F. B. Meek.
Formation: Jurassic [Cretaceous ?].
Location: Mariposa estate, California.

—— mosquensis (Buch.) Eichwald. (1871.)
Geog. Paleont., Bemerk. Halb. Mang. Aleutischen Inseln., pp. 185–186, Taf. 17, figs. 7–12. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— mosquensis ? (Von Buch.) Whiteaves. (1876.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 1, pp. 74–78, pl. 10, figs. 3, 3*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— mosquensis var. concentrica. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 151–153. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.

Aucella—Continued.

Location: Tatlayoco lake, B. C., banks of the upper Skagit river, B. C., Browning creek, Forward inlet, Quatsino sound, northwest coast of Vancouver island, Long island; Harrison lake, B. C.; also west shore and peninsula on the southeast shore of the same lake, and Chilliwack river, near Tamiahai, B. C.; west side of Winter harbor, in Forward inlet; west of Fraser river, B. C., a little to the north of sources of Bridge river, B. C., from a mountain six or seven thousand feet high above sea level; south fork of Quesnel river, near the foot of Quesnel lake; Porcupine river, N. W. T., in lat. 67° 8′ N., long. 137° 47′ W.; Yukon river, Alaska, eight miles below the Antoine river, in lat. 65° 15′ N., long. 141° 40′ W.

—— piochii Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 194–195, pl. 32, figs. 92*a–c*. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: From Mount Diablo, at various points along the east face of the Coast range to the north end of the Sacramento valley; Washington, east of Puget sound; Colusa county, east of Clear lake, California.

—— piochii (Gabb) Whiteaves. (1882.)

Proc. and Trans. Roy. Soc., Canada, vol. 1, sec. 4, pp. 84, 85. Montreal, 1883. J. F. Whiteaves.

Formation: Cretaceous.

Location: Tatlayoca lake and Forward inlet, banks of the upper Skagit.

—— piochii (Gabb) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, p. 239. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: Skidegate inlet, west of Alliford bay.

—— piochii (Gabb) Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser. 1886. App. I, pp. 111–112*b*. Montreal, 1887. J. F. Whiteaves.

Formation: Cretaceous.

Location: Tatlayoca lake, B. C.; banks of the upper Skagit river, B. C.; Browning creek, Forward inlet, Quatsino sound, northwest coast of Vancouver island; Long island, Harrison lake, B. C.; west shore and peninsula on the southeast shore of the same lake, and Chilliwack river, near Tamiahai creek, B. C.; Browning creek, Forward inlet; Raft cove on the west coast of Vancouver island, north of Quatsino sound; west of Fraser river, B. C., a little to the north of sources of Bridge river, B. C.; from a mountain six or seven thousand feet high above sea level, south fork of Quesnel river, near the foot of Quesnal lake.

—— piochii (Gabb) White. (1888.)

Mong. U. S. Geol. Sur., vol. 13, pp. 226–232, pl. 4, figs. 3–5. Wash., 1888. C. A. White.

Formation: Cretaceous.

—— Fischer. (1872.)

Comptes Rend., 1872, vol. LXV, p. 1785. Paris, 1872. P. Fischer.

Formation: Jurassic [Cretaceous ?].

Location: Alaska.

Aulacoceras carlottense n. s. Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser. 1886. App. I, p. 109*b*. Montreal, 1887. J. F. Whiteaves.

Formation: Triassic.

Location: Houston Stewart channel, in the Queen Charlotte islands.

Aulacomya (sub. gen. Mörch.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 68. Wash., 1876. F. B. Meek.

Aulopora sp. Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 220. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Timber creek, New Jersey.

Avalana subglobosa n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 64. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Moreau trading post, Nebraska.

Avellana (d'Orb) Meek. (1859.)

N. W. Terr. Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 184. Toronto, 1859. F. B. Meek.

—— (sub. gen. d'Orb.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 283. Wash., 1876. F. B. Meek.

—— concinna (H. & M. sp.) Meek. (1859.)

N. W. Terr. Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind., p. 184. Toronto, 1859. F. B. Meek.

Formation: Cretaceous.

Location: Two creeks, on the Assiniboine, Canada.

—— texana n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 597. St. Louis, 1856–1860. B. F. Shumard.

Formation: Cretaceous.

Location: Near Bosque creek, in Bosque county, Texas.

Avicula (Lam.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 63. Phila., 1834. S. G. Morton.

—— abrupta n. s. Conrad. (1853.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser. 1850–1854, p. 274, pl. 24, figs. 5, 6. Phila., 1850–1854. T. A. Conrad.

Formation: Cretaceous.

Location: Nimrod Woodward's farm, New Jersey.

—— convexo-plana n. s. Roemer. (1849.)

Texas, pp. 400–401. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Fredericksburg, Texas.

—— convexo-plana Roemer. (1852.)

Kreide. von Texas, pp. 61–62, Taf. 7, figs. 9a–d. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Fredericksburg, Texas.

a—Continued.

tacea n. s. Conrad. (1843.)
lydrog. Basin upper Mississippi river, I. N.
llet. App. C, p. 170. Wash., 1843. T. A.
ad Formation: Cretaceous.
n: On the Missouri river.

brosa n. s. M. & H. (1856.)
Acad. Nat. Sci., Phila., for 1856, pp. 86–87.
., 1857. Meek & Hayden.
tion : Cretaceous.
n : Forks of Cheyenne river, Nebraska.

deni n. s. H. & M. (1854.)
Am. Acad. Arts and Sci., vol. 5, n. s., p. 382,
figs. 5, *a*, *b*. Cambridge and Boston, 1855.
& Meek.
tion : Cretaceous.
n : On the Missouri near Red Cedar island,
ty-five miles below Fort Pierre.

frayi n. s. Gabb. (1864.)
ur. Cal.. Paleont., vol. 1, pp. 29–30, pl. 6,
6. Phila., 1864. W. M. Gabb.
ion : Triassic.
n: Star district, Humboldt county, Nevada.

escens n. s. Shumard. (1861.)
Boston Soc. Nat. Hist., vol. 8, 1861–1862,
3–204. Boston, 1862. B. F. Shumard.
ion : Cretaceous.
n : Head of Pine creek, Lamar county,
.

pes n. s. Morton. (1834.)
Org. Rem. Cret. Gr. U. S., p. 63, pl. 17, fig.
hila., 1834. S. G. Morton.
ion : Cretaceous.
n : Delaware.

ata (Roem.) Eichwald. (1871.)
aleont. Bemerk. Halb. Mang. Aleutischen
., pp. 187–188, Taf. 16, fig. 5. St. Peters-
1871. E. Eichwald.
ion : Cretaceous.
n : Alaska.

æformis n. s. (E. & S.) (1854.)
ad. Nat. Sci., Phila., vol. 7, p. 153. Phila.,
Evans & Shumard.
on : Cretaceous.
n : Sage creek, Nebraska.

æformis (E. & S.) Meek. (1859.)
err., Rep. Prog. Assin. and Saskat. Expl.
. H. Y. Hind, p. 183, pl. 1, fig. 6. Toronto,
F. B. Meek.
on : Cretaceous.
: Sandy hills, south branch, Saskatche-
Height of land in the Qu'Appelle valley,
he elbow of south branch of the Saskatch-
Canada.

ronata n. s. Gabb. (1864.)
r. Cal., Paleont., vol. 1, p. 30, pl. 5, fig.
hila., 1864. W. M. Gabb.
on : Triassic.
: Gifford's ranch, Plumas county, Cal.

ascana n. s. E. & S. (1857.)
Acad. Sci., St. Louis, vol. 1, 1856–1860, p.
t. Louis, 1856–1860. Evans & Shumard.
on : Cretaceous.
: Near Moreau river, Nebraska territory.

Avicula—Continued.

—— nebrascana (E. & S.) Meek. (1859.)
N. W. Terr. Rep. Prog. Assin. and Saskat. Expl. Exped. H. Y. Hind, p. 183, pl. 1, fig. 7. Toronto, 1859. F. B. Meek.
Formation : Cretaceous.
Location : South branch of the Saskatchewan, Canada.

—— parkensis n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 115. Wash., 1876. C. A. White.
Formation : Cretaceous.
Location : South of Grand river, Middle park, Colorado.

—— pedernalis n. s. Roemer. (1849.)
Texas, p. 400. Bonn. 1849. F. Roemer.
Formation : Cretaceous.
Location : Fredericksburg, Texas.

—— pedernalis Roemer. (1852.)
Kreide. von Texas, p. 61, Taf. 8, figs. 1*a*, *b*. Bonn, 1852.
Formation : Cretaceous.
Location : Fredericksburg, Texas.

—— pellucida n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 186–187, pl. 25, fig. 172. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Near Martinez; ranch of San Luis Gonzaga, Pacheco's Pass, California.

—— petrosa n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 274, pl. 24, fig. 15. Phila., 1850-1854. T. A. Conrad.
Formation : Cretaceous.
Location : Chesapeake and Delaware canal.

—— planiuscula n. s. Roemer. (1849.)
Texas, p. 401. Bonn, 1849. F. Roemer.
Formation : Cretaceous.
Location : Waterfall, near New Braunfels, Texas.

—— planiuscula Roemer. (1852.)
Kreide. von Texas, p. 62, Taf. 7, fig. 7. Bonn, 1852. F. Roemer.
Formation : Cretaceous.
Location : Waterfall of the Guadalupe below New Braunfels, Texas.

—— rarocostata n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk Halb. Mang. Aleutischen Inseln., p. 188, Taf. 16, figs. 6–8. St. Petersburg, 1871. E. Eichwald.
Formation : Cretaceous.
Location ; Alaska peninsula.

—— subgibbosa n. s. M & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 180. Phila., 1861. Meek & Hayden.
Formation : Cretaceous.
Location : Long lake, Nebraska.

—— triangularis n. s. (E. & S.) (1854.)
Proc. Acad. Nat. Sci., Phila., vol. 7, p. 163. Phila., 1856. Evans & Shumard.
Formation : Cretaceous
Location : Sage creek, Nebraska.

Avicula—Continued.

—— **volgensis** (d'Orb) Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halb. Mang. Aleutischen Inseln., p. 189, Taf. 16, figs. 9, 10. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— (**Monotis**) **tenuicostata** n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, pp. 50–51. Phila., 1859. Meek & Hayden.
Formation: Jurassic.
Location: Southwestern and eastern sides of Black hills.

—— (**Oxytoma**?) **gastrodes** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 491–492. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (**Oxytoma**) **mucronata** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 357-358, pl. 4, figs. 1, 2. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Two miles south of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— (**Pseudoptera**) **propleura** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 489–490. Wash., 1873. F. B. Meek.
Formation; Cretaceous.
Location: Coalville, Utah.

—— (**Pseudoptera**) **rhytophora** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 490–491. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous.]
Location: United States.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 63. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Delaware.

Aviculopecten (McCoy.) H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 288. Wash., 1877. Hall & Whitfield.

—— **altus** n. s. White. (1880.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, p. 110. Wash., 1880. C. A. White.
Formation: Jura-Trias. [Triassic].
Location: Locality No. 3, southeastern Idaho.

Aviculopecten—Continued.

—— **idahoensis** (Meek) White. (1880.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, pp. 110–111. Wash., 1880. C. A. White.
Formation: Jura-Trias. [Triassic].
Location: About sixty-five miles north of the boundary line between Idaho and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles south of John Gray's lake. Locality No. 1. Also, locality No. 3.

—— ? **idahoensis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 110–111, pl. 32, fig. 2*a*. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Gray's lake.

—— **pealei** n. s. White. (1880.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, pp. 109–110. Wash., 1880. C. A. White.
Formation: Jura-Trias [Triassic].
Location: Southeastern Idaho.

—— ? **pealei** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 109–110, pl. 32, fig. 4*a*. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Gray's lake.

—— ? **superstrictus** n. s. White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 144, pl. 37, fig. 4*a*, *b*. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Head of Lincoln valley.

—— (**Eumicrotis**?) **augustensis** n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 288, pl. 7, figs. 14–16. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Shoshone springs, Augusta mountains.

—— (**Pseudomonotis**?) **idahoensis** n. s. White. (1872.)
Fifth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp., 374–375. Wash., 1872. F. B. Meek
Formation: Jurassic.
Location. Lincoln valley, near Fort Hall, Idaho.

Axinæa (Poli) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser. 1858–1860, p. 396. Phila., 1858–1860. W. M. Gabb.

Axinæa—Continued.

—— **alta** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 101, pl. 11, figs. 26–29. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: C. Bruere's pits, Walnford; also at upper Freehold, New Jersey.

—— **hamula** (Morton sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 317–318. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Georgia.

—— **holmesiana** n. s. White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 59–60, pl. 20, figs. 2*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Point of Rocks station, Bitter creek valley, Wyoming.

—— **mortoni** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 44, pl. 1, fig. 14. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, New Jersey.

—— **mortoni** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 99–101, pl. 11, figs. 23–25. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel; Walnford; Manalapan; George Hunt's pits; Crosswicks, New Jersey.

—— **rotundata** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 396, pl. 68, fig. 33. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Alabama.

—— **sagittata** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 196. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.

—— **sagittata** (Gabb?) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 39. Wash., 1889. C. A. White.
Formation: Cretaceous, Vancouver group.
Location: Sucia island.

—— **subaustralis** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila. for 1861, p. 365. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **subimbricata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 95–96, pl. 28, figs. 14*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location. Heart river.

—— **veatchii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 197, pl. 25, figs. 183, 183*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county; Texas Flat, Placer county; Pence's ranch, Butte county; Cow creek, Shasta county; Orestimba cañon, Stanislaus county; San Diego, California.

Axinæa—Continued.

—— **veatchii** (Gabb) Whiteaves. (1874.)
Geol. Sur. Canada, Rep. Prog. for 1873–1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Coast, a little west of Northwest bay, Vancouver island.

—— **veatchii** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can.: Mes. Foss., vol. 1, pt. 2, p. 162. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island; Blunden point; Northwest bay; entrance to Departure bay, Vancouver island; Sucia islands.

—— **veatchii** (Gabb) var. Whiteaves. (1874.)
Geol. Sur. Canada, Rep. Prog. for 1873–1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **wyomingensis** n. s. Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 149–150, figs. 2, 3, text. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: East side of Cooper creek, near Old Stage station; Laramie Plains, Wyoming.

—— **(Limopsis?) sagittata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 197–198, pl. 31, figs. 267–267*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon; Martinez, California.

—— **sp. undet.** Whiteaves. (1874.)
Geol. Sur. Canada: Rep. Prog. for 1873–1874, p. 265. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— **?** Whiteaves. (1874.)
Geol. Sur. Canada, Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-quarter and two and one-half miles up.

Baculites, (Lam.) Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 40, New Haven, 1820. Thomas Say.

—— (Lam.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 392. Wash., 1876. F. B. Meek.

—— **annulatus** n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 265. Phila., 1856. T. A. Conrad.
Formation: Cretaceous.
Location: Dallas county [Texas].

—— **asper** n. s. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 23, p. 291, New Haven, 1833. S. G. Morton.
Formation: [Cretaceous].
Location: Alabama.

Baculites—Continued.

—— asper Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 43, 44, pl. 1, figs. 12, 13; pl. 13, fig. 2. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Cahawba and Prairie Bluff, Alabama.

—— asper (Morton) Roemer. (1849.)

Texas, p. 416, Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall near New Braunfels, Tex.

—— asper (Mort.) Roemer. (1852.)

Kreide. von Texas, p. 36, Taf. 2, figs. 2*a*–*d*. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— asper (Morton?) Meek. (1876.)

Rep. U. S. Geol. Sur., Terr., vol. 9, pp. 404, 405, pl. 39, figs. 10*a*, *d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Near the mouth of Judith River, Montana.

—— asper (Mort.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, p. 82. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Rocky Spring Ridge, near MacLeod Benton trail; west flank of West Butte, Montana, but close to the forty-ninth parallel.

—— anceps (Lam.) Roemer. (1849.)

Texas, p. 416, Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall near New Braunfels, Tex.

—— anceps (Lam.) Roemer. (1852.)

Kreide. von Texas, pp. 36, 37, Taf. 2, figs. 3*a*–*g*, Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of Guadalupe below New Braunfels and at the crossing of the Cibolo between New Braunfels and San Antonio, Tex.

—— anceps (Lam.) Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, pp. 395, 396. Phila., 1862. Wm. M. Gabb.

Formation: Cretaceous.

—— anceps var. obtusus, n. var. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 406–408, figs. 57–60, p. 406. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Deer creek, on the North Platte [Nebraska].

—— anceps var. obtusus Meek. (1876.)

Rep. Expl. Exped., Santa Fe, New Mexico, to junction of Grand and Green rivers, pp. 130–132, pl. 2, figs. 1*a*–*h*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Rio de la Plata [Colorado].

—— baculus n. s. M. & H. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 445. Phila., 1862. Meek & Hayden.

Formation: Cretaceous.

Location: Deer creek, a tributary of the north branch of Platte river, Nebraska.

Baculites—Continued.

—— carinatus n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 44, pl. 13, fig. 1. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Prairie Bluff, Alabama.

Baculite[s] chicoensis n. s. Trask. (1856.)

Proc. Cal. Acad. Nat. Sci., vol. 1, 1st ed., pp. 85, 86, pl. 2, figs. 2 and 2*a*. San Francisco, 1854–1857. J. B. Trask.

Formation: Upper Eocene. [Cretaceous].

Location: Chico Creek, California.

Baculites chicoensis (Trask) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 80, 81, pl. 17, figs. 27, 27*a*; pl. 14, figs. 27*b*, 29, 29*a*. Phila., 1864. W. M. Gabb.

Formation: Cretaceous (Div. A).

Location: Chico creek; Pence's ranch, Butte county; Cottonwood creek, Shasta county; Orestimbo cañon, Stanislaus county; in débris at Point Loma, near San Diego (?) and near Martinez, Cal.

—— chicoensis (Trask?) Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 364, 365, pl. 4, figs. 2, 2*a*–*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Sucia islands.

—— chicoensis (Trask.) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 114. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Southwest side of Denman island; Sucia islands; below Dodd narrows, Vancouver island.

—— chicoensis (Trask) White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 49. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Sucia and Sheep Jack islands.

—— columna n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 44, pl. 19, fig. 8. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Prairie Bluff, Alabama.

—— compressa n. s. Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, pp. 41–42. New Haven, 1820. Thomas Say.

Formation: [Cretaceous.]

Location: Missouri river, from White river to the Mandans.

—— compressa (Say) Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 291 (pl. 9, fig. 1, [vol. 24]). New Haven, 1833. S. G. Morton.

Formation: [Cretaceous.]

Location: Great Bend of the Missouri river.

—— compressus (Say) Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, pl. 9, fig. 1. New Haven, 1833. S. G. Morton.

[Described in vol. 23.]

Baculites—Continued.

—— **compressus** (Say) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 43, pl. 9, fig. 1. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Missouri river, between White river and the Mandan settlements.

—— **compressus** (Say) Morton. (1841.)

Jour. Acad. Nat. Sci., Phila., vol. 8, 1st. ser., 1839-1842, p. 211. Phila., 1839-1842. S. G. Morton.

Formation: Cretaceous.

Location: Great Bend of the Missouri river. (Lat. 43° 40′ N.)

—— **compressus** (Say) H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 400-402, pl. 5, figs 2, *a*, *b*, pl. 6, figs. 8, 9. Cambridge and Boston. Hall & Meek.

Formation: Cretaceous.

Location: Sage creek and Great Bend of Missouri river, etc.

—— **compressus** (Say) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 400-404, pl. 20, figs. 3*a*-*c*; figs. 55, 56, p. 403. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Upper Missouri river, at or near the Great Bend; on Sage creek; on Cheyenne river; near Milk river.

—— **compressus** (Say) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, pp. 49, 50. Montreal, 1885. J. F. Whiteaves,

Formation: Cretaceous.

Location: Creek twelve miles east of White Mud river (or Frenchman's creek) and White Mud river near the 49th parallel; also, east branch of the Poplar river, on the 49th parallel; elbow of south Saskatchewan; Bow river, between Horseshoe bend, and Belly river, five miles above Coal Banks; St. Mary river, west of Mac Leod-Benton trail; Belly river, twenty-two miles and a half above the mouth of the Waterton; Milk River ridge and Red Deer river, above crossing of Lord Lorne trail; Ross creek, near Irvine station, on the Canadian Pacific railway; Bull Pound creek, section 3 and 15, township 26, range 14, west of 4th principal meridian; Battle river, township 38, between ranges 12 and 13; Berry creek, township 25, range 12, Canada.

—— **compressus** (Say) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 2, p. 182. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: "The Nose," township 37, range 8, west of the 4th principal meridian, and Nose creek, township 37, range 9, west of the same meridian; North Saskatchewan, near mouth of Moose Hill creek; same river in township 56, range 5, west of the 4th principal meridian; mouth of Vermilion river, in township 53, range 3, west of the 4th principal meridian; North Saskatchewan river, township 54, range 2, west of 4th meridian, Northwest Territory.

Baculites—Continued.

—— **compressus** (Say) Brown. (1891.)

Proc. Acad. Nat. Sci. Phila. [vol. 43], pp. 159, 160, figs. 1-6. Phila., 1891. A. P. Brown.

Formation: Cretaceous.

Location: Vicinity of Deadwood, S. Dak.

—— **faujasi** (Lam.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 240. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Mullica Hill, New Jersey.

—— **gracilis** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856-1860, p. 596. St. Louis, 1856-1860. B. F. Shumard.

Formation: Cretaceous.

Location: Shawnee creek, Grayson County, Texas.

—— **grandis** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5 n. s., pp. 402-404, pl. 7, figs. 1, 2; pl. 8, figs. 1, 2; pl. 6, fig. 10. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: Mauvaises Terres, head of Bear creek.

—— **grandis** (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 398-400, pl. 33, figs. 1*a*, *b*; figs. 53, 54, p. 399. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Cheyenne River, near the Black hills, [S.] Dakota.

—— **grandis** (H. & M.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, pp. 50, 51. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: East fork of Milk river, in drift bowlders, Canada.

—— **grandis** (H. & M.) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 2, p. 182. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Sounding Creek, township 30, range 8, west of the 4th principal meridian, Northwest Territory.

—— **inornatus** n. s. Meek. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 216. Phila., 1862. F. B. Meek.

Formation: Cretaceous.

Location: Sucia island, Gulf of Georgia.

—— **labyrinthicus** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 44, pl. 13, fig. 10. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Prairie Bluff, Alabama.

—— **labyrinthicus** (Morton) Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila, for 1861, pp. 394, 395. Phila, 1862. Wm. M. Gabb.

Formation: Cretaceous.

Baculites—Continued.

—— **occidentalis** n. s. Meek. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, pp. 316, 317. Phila., 1862. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, eastern shore of Vancouver island.

—— **occidentalis** (Meek) Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 145. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Vancouver island.

—— **occidentalis** Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 366–367, pl. 4, figs. 1, 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Sucia island.

—— **occidentalis** (Meek) Whiteaves. (1879.)

Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 2, p. 115. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island.

—— **ovata** n. s. Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, p. 41. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: Neversink hills, Monmouth county, New Jersey.

—— **ovata** (Say) Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 89–90, pl. 5, fig. 6. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Sandy Hook bay, New Jersey.

—— **ovatus** (Say) Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 196, pl. 5, figs. 5–6, and pl. 8, figs. 6–8. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
(No pl. 8 in the vol.)

—— **ovatus** (Say) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 280. New Haven, 1830. S. G. Morton.
Formation: [Cretaceous.]
Location: Blue marls of Monmouth and Burlington counties, in New Jersey, and at the deep cut of the Chesapeake and Delaware canal.

—— **ovatus** (Say) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pl. 1, figs. 6–8. New Haven, 1830. S. G. Morton.

—— **ovatus** (Say) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 42, 43, pl. 1, figs. 6–8. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey, Delaware, Alabama.

—— **ovatus** (Say) Marcou. (1853.)

Geol. Map of the U. S. and British Provinces of N. A., p. 46, pl. 7, fig. 5. Boston, 1853. Jules Marcou.
Formation: Cretaceous.
Location: New Jersey, Delaware, Alabama, and Texas.

Baculites—Continued.

—— **ovatus** (Say) H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s. pp. 399, 400, pl. 5, figs. 1*a–c*; pl. 6, figs. 1–7. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Great Bend of the Missouri and various other localities on that river, between Fort Pierre and the mouth of Big Sioux river.

—— **ovatus?** (Say) Meek. (1858.)

Trans. Albany Inst., vol. 4, pp. 48, 49. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— **ovatus** (Say) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, pp. 199, 200, pl. 13, figs. 4*a–c*; 5*a–c*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

—— **ovatus** (Say) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 394–397, pl. 20, figs. 2*a–d*, 1*a*, *b*, and figs. 51, 52, p. 397. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great Bend of the Missouri below Fort Pierre, Sage creek, and Cheyenne river, and near the eastern base of the Black hills, all in S. Dakota. Along the Missouri, between Fort Benton and Fort Union, and on the Yellowstone river, in Montana, as well as at many localities along the eastern base of the Rocky mountains and elsewhere in Colorado.

—— **ovatus** (Say) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 206. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colorado.

—— **ovatus** (Say) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 185, 186. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fossil ridge, Colorado.

—— **ovatus** (Say) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Col.

—— **ovatus** (Say) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 225. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near White River Indian agency, Colorado.

—— **ovatus** (Say?) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **ovatus** (Say) Stanton. (1887.)

Proc. Colorado Sci. Soc., vol. 2, pt. 3, for 1887, p. 185. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of Boulder, Col.

es—Continued.

itus (Say) **Whiteaves. (1889.)**
and Nat. Hist. Sur. Can.; Cont. Can. Pa-
t., vol. 1, pt. 2, pp. 181,182. Montreal,1889.
Whiteaves.
tion : Cretaceous.
on: Ghost river, township 25, range 6 west of
fifth principal meridian; North Saskatche-
river, near mouth of Moose Hill creek;
on the same river, in township 54, range
d in township 56, range 5, in each case
of the fourth principal meridian; mouth
ermilion river, in township 54, range 3,
of the same meridian, Northwest Terri-

lmani n. s. Conrad. (1858.)
cad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-
p. 335, pl. 35, fig. 24. Phila., 1855-1858.
Conrad.
ion : Cretaceous.
n : Owl creek, three miles north of the
of Ripley, Miss.

aensis n. s. Conrad. (1858.)
cad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-
p. 334, pl. 35, fig. 27. Phila., 1855-1858.
Conrad.
ion : Cretaceous.
n: Owl creek, three miles north of the
of Ripley, Miss.

ndet. Troost. (1840.)
eol. Rep. Tennessee, p. 53. Nashville,
G. Troost.
on : Cretaceous.
n: McNairy county, Tennessee.

undet. Gabb. (1864.)
r. Cal., Paleont., vol. 1, p. 81, pl. 17, figs.
; pl. 14, fig. 28a. Phila., 1864. W. M.

on: Cretaceous.
: Vancouver island.

ndet. Whiteaves. (1874.)
r. Canada; Rep. Prog. for 1873-1874, p.
Montreal, 1874. J. F. Whiteaves.
on : Cretaceous.
: Below Dodd Narrows.

peregrinus n. s. Morton.

r. Sci., 1st ser., vol. 24, p. 131, pl. 10, fig.
w Haven, 1833. S. G. Morton.
on : Cretaceous. [Tertiary.]
: Southern states.

grinus Morton. (1834.)
rg. Rem. Cret. Gr. U. S., p. 72, pl. 10, fig.
ila., 1834. S. G. Morton.
on: Cretaceous. [Tertiary.]
: South Carolina.

(Gray) (typical) Meek. (1876.)
S. Geol. Sur. Terr., vol. 9, p. 77. Wash.,
F. B. Meek.

atula n. s. White. (1883.)
Ann. Rep. U. S. Geol. and Geogr. Sur.,
part 1, p. 19, pl. 11, fig. 5a. Wash.,1883.
White.
on: Cretaceous.
: Cimarron, New Mexico.

Barbatia—Continued.

—— coalvillensis White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235, Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— coalvillensis White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— coalvillensis White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 286, 287, pl. 6, figs. 2*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (Plagiarca) carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh,1875. W. C. Kerr, App. A, p. 4, pl. 1, fig. 11. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— (Polynema) lintea n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh,1875. W. C. Kerr, App. A, p. 4, pl. 1, fig. 12. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— (Polynema?) parallela Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 80-81, pl. 2, fig. 10. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kansas.

Bariosta (subgen. Raf.) **Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 513. Wash., 1876. F. B. Meek.

Baroda (Stoliczka) **Conrad. (1875.)**
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr, App. A, p. 8. T. A. Conrad.

—— carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr, App. A, pp. 8, 9, pl. 2, fig. 10. T. A. Conrad.
Formation : Cretaceous.
Location : Snow Hill, Greene county, North Carolina.

—— subelliptica n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 294, 295, pl. 10, figs. 4*a*–*d*. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Mouth of the Saint Vrains, northern Colorado.

Baroda—Continued.

—— wyomingensis (Meek.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 293, 294, pl. 10, figs. 3*a*, *b*. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Mouth of Deer creek, on North Platte, Wyoming.

Bathyomphalus (sub. gen. Ag.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 536. Wash., 1876. F. B. Meek.

Batissa (Gray) White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 60. Wash., 1889. C. A. White.

—— dubia n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 61, pl. 11, figs. 1 and 2. Wash., 1889. C. A. White.
Formation : Cretaceous.
Location : Newcastle and Wilkeson. Washington.

—— newberryi n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 60, pl. 9, figs. 1-3. Wash., 1889. C. A. White.
Formation : Cretaceous.
Location : Carbonado, Wilkeson (Fletts creek), and Newcastle, Washington.

Beaumontia (Edwards & Haime.) White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 2, p. 221. Wash., 1880. C. A. White.

—— ? solitaria n. s. White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 2, p. 221. Wash. 1880. C. A. White.
Formation: Cretaceous.
Location: Fossil creek, sixteen miles west of Greely and six miles south of Fort Collins, Colorado.

—— ? solitaria White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Terr., part 1, p. 8, pl. 12, figs. 13*a–c*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Northern Colorado.

Bela (Leach) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 152. Phila., 1869. W. M. Gabb.

—— clathrata n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 152, 153, pl. 26, fig. 31. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, California.

Belemnitella (d'Orb.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 501-503. Wash., 1876. F. B. Meek.

—— americana (Mort.) Emmons. (1858.)

Rep. N. Carolina Geol. Sur., p. 246, fig. 101. Raleigh, 1858. E. Emmons.
Formation: Cretaceous.
Location: Black rock and Rocky point, North Carolina.

Belemnitella—Continued.

—— ? bulbosa n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 70. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebraska [S. Dakota].

—— bulbosa (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 504, pl. 33, figs. 2*a–e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Moreau trading-post, [S.] Dakota.

—— compressa n. s. Emmons. (1858.)

Rep. N. Carolina Geol. Sur., p. 246, figs. 102, 103. Raleigh, 1858. E. Emmons.
Formation: Cretaceous.
Location: North Carolina.

—— manitobensis n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 189-190, pl. 26, figs. 3, 3*a*, *b*. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: East bank of the Assiniboine river, a short distance below the mouth of the Little Souris river; Ochre river, Riding mountains; Vermilion river, township 24, range 20 W.; South Duck river, township 34, range 29 W.; Swan river, township 35, range 29 W.; Assiniboine river, section 36, township 8, range 11 W., Manitoba.

—— mucronata (Blainv.) Marcou. (1853.)

Geol. Map of U. S. and British Provinces of N. A., p. 46., pl. 7, fig. 3. Boston, 1853. Jules Marcou.
Formation: Cretaceous.
Location: New Jersey, Delaware, Georgia, Arkansas, Tennessee, and Texas.

—— mucronata (Schloth.) Cook. (1868.)

Geol. of New Jersey, p. 375. Newark, 1868. G H. Cook.
Formation: Cretaceous.
Location: New Jersey.

Belemnites absolutus (Fischer) Toula. (1874.)

Die Zweite Deutsche Nordpolarfahrt, Zweiter Band, p. 501, Taf. 2, fig. 1. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous?]
Location: Kuhn island, east coast of Greenland.

—— ambiguus n. s. Morton. (1830.)

Am. Jour. Sci. 1st ser., vol. 17, p. 281. New Haven. 1830. S. G. Morton.
Formation : [Cretaceous.]
Location : Gloucester county, New Jersey.

—— ambiguus Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 192-194, pl. 8. figs. 4, 5. Phila., 1827-1831. S. G. Morton.
Formation : Cretaceous.
Location : Gloucester county and near Vincentown, N. J.
(No pl. 8 in vol.).

Belemnites—Continued.

—— **ambiguus** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pl. 1, figs. 4, 5. New Haven, 1830. S. G. Morton.

—— ? **ambiguus** Morton. (1834.)

Synop. Org. Rem. Cret. Gr., U. S., pp. 35, 36, pl. 1, figs. 4, 5. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Timber creek, Gloucester county, New Jersey.

—— **americanus** n. s. Morton. (1830.)

Am. Jour. Sci., 1st. ser., vol. 17, p. 281. New Haven, 1830. S. G. Morton.

Formation: [Cretaceous.]

Location: New Jersey.

—— **americanus** Morton. (1830.)

Am. Jour. Sci, 1st. ser., vol. 18, pl. 1, figs. 1-3. New Haven, 1830. S. G. Morton.

—— **americanus** Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 190, pl. 8, figs. 1-3. Phila., 1827-1831. S. G. Morton.

Formation: Cretaceous.

Location: Near Arneytown, N. J.

(= pl. 5, fig. 7. No pl. 8 in vol.)

—— **americanus** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 34, 35, pl. 1, figs. 1-3, 3*a*, and pl. 17, fig. 2. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey, Delaware, North Carolina, and Georgia.

—— **americanus** Morton. (1841.)

Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839-1842, p. 211. Phila., 1839-1842. S. G. Morton.

Formation: Cretaceous.

Location: Great Bend of the Missouri river (lat. 43° 40′ N.).

—— **conformis** n. s. Eichwald. (1871.)

Geog.-Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 153, 154, Taf. 11, figs. 20-24. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Chasik island, Tukusitnu bay, Alaska.

—— **densus** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, pp. 58, 59. Phila., 1859. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— **densus** M. & H. (1865.)

Paleont. Up. Missouri; Smithson. Cont. Knowl., vol. 14, No. 172, pp. 126, 127, pl. 4, figs. 10*a-c*, and pl. 5, figs. 1, 1*a-h*. Wash., 1865. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— **densus** (M. & H.) Meek. (1876).

Rep. Expl. Great Basin Terr., Utah, p. 358, pl. 3, fig. 4*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Jurassic.

Location: On the North Platte, near the Red Buttes.

Belemnites—Continued.

—— **densus** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dakota, pp. 381, 382, pl. 6, figs. 15-19. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: On Beaver creek, east of the Belle Fourche, near Bear Lodge butte, Black hills.

—— **densus** (M. & H.) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 194, 195, pl. 22, fig. 1. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: Coal locality south of Skidegate channel, Queen Charlotte islands.

—— **impressus** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 58, pl. 9, figs. 2, 2*a*. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: North fork of Cottonwood creek, southwest of Horsetown, Shasta county, California.

—— **impressus** Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 129. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: East side of the Northern Coast Range, more especially in Colusa county, and elsewhere east of Clear lake, California.

—— **impressus** (Gabb) Whiteaves. (1883.)

Proc. and Trans. Roy. Soc. Canada, vol. 1, sec. 4, p. 82. Montreal, 1883. J. F. Whiteaves.

Formation: Cretaceous.

Location: Tatlayoco lake; Skagit river; Jackass mountain, Canada.

—— **inæquilateralis** n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 151, 152, Taf. 11, figs. 12-16. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Chasik island, Alaska.

—— **macritatis** n. s. White (1884.)

Bull. U. S. Geol. Sur., No. 4, pp. 14-15, pl. 6, figs. 13-14. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Fossil point, Port Möller, Alaska.

—— **mucronatus** (Schlot.) Bronn. 1838.)

Lethæa Geognostica Zweiter Band, pp. 716-718, Taf. 33, figs. 10*a-c*, 11. Stuttgart, 1838. H. G. Bronn.

Formation: Cretaceous.

Location: Bufflestown, New Jersey; Camden, South Carolina.

—— **mucronatus** (Blainv.) Credner. (1870.)

Zeitsch. Deutsch. Geol., Ges. Band 22, pp. 238-240. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Mullica Hill, New Jersey.

—— **nevadensis** n. s. Meek. (1877.)

Rep. Geol. Expl. 40th Parallel, vol. 4, pt. 1, pp. 138-139, pl. 12, figs. 7*a*, *b*; (8*a*, *b*?) Wash., 1877. F. B. Meek.

Formation: Jurassic.

Location: Cottonwood canon, West Humboldt range; American district, West Humboldt range, Nevada.

Belemnites—Continued.

—— **pacificus** n. s. Gabb. (1864.)
Proc. Cal. Acad. Nat. Sci., vol. 3, p. 173. San Francisco, 1863–1868. W. M. Gabb.
Formation: Jurassic [Cretaceous?].
Location: Mariposa estate, Mariposa county, [California.]

—— **pacificus** (Gabb) Meek. (1865.)
Geol. Sur. Cal. Geology, vol. 1, p. 482. Phila., 1865. F. B. Meek.
Formation: Jurassic [Cretaceous].
Location: Mariposa estate, California.

—— **panderianus** (d'Orb.) Toula.
Die Zweite Deutsche Nordpolarfahrt, Zweiter Band, pp. 500, 501, Taf. 1, figs. 2*a–c*. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous?].
Location: Kuhn island, east coast of Greenland.

—— **pistilliformis** (Bl.) Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 150, 151. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Chasik island, Alaska.

—— **sicarius** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 152, 153, Taf. 11, figs. 5–8. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **skidegatensis** nom. prov. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 195–197, pl. 22, fig. 2, 2*a–c*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skidegate inlet, east side of Alliford bay; south side of same bay.

—— **subconicus** (Lam.) Morton. (1828.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 91, 92, pl. 5, fig. 7. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Sandy Hook; Woodward's farm, near Walnford; Mullica Hill, New Jersey; Cockspur island, South Carolina.

—— **sp. undet.** Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 44. New Haven, 1820. Thomas Say.
Formation: Alluvium [Cretaceous].
Location: New Jersey.

—— **sp. undet.** Toula. (1874.)
Die Zweite Deutsche Nordpolarfahrt, Zweiter Band, pp. 501, 502. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous?].
Location: Kuhn island, east coast of Greenland.

—— **sp. undet.** Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, p. 14. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

Belemnites—Continued.

—— **sp. undet.** Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 11–13, pl. 1, figs. 1*a–c*, and fig. 1, p. 11. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **sp. undet.** (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 172. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— **sp. undet.** Meek. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 53, pl. 8, figs. 9, 9*a*. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee Valley, Plumas county, California.

—— **sp. undet.** White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 67, pl. 14, fig. 4, Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Kialagvic bay, Alaska.

—— **sp. undet.** White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 67, pl. 13, fig. 6. Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Kialagvic bay, Alaska.

—— **?** Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–77, p. 157. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— **?** Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–77, p. 157. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— **?** Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, pp. 407, 408. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— **?** Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 408, Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

Bicrisina (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–1863, pp. 173, 174. Phila., 1862–1863. Gabb & Horn.

—— **abbotii** G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–1863, p. 174 [pl. 21], fig. 65. Phila., 1862–1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica Hill, New Jersey.

ra (d'Orb.) G. & H. (1862.)
Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–3, p. 152. Phila., 1862–1863. Gabb & Horn.

ɜjuncta n. s. G. & H. (1862.)
Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–3, pp. 153, 154 [pl. 20], fig. 37. Phila, 1862–3. Gabb & Horn.
ation: Cretaceous.
ion: Timber creek and near Mullica Hill, r Jersey.

rta n. s. G. & H. (1862.)
Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–3, pp. 152, 153 [pl. 20], fig. 36. Phila., 1862–3. Gabb & Horn.
ation: Cretaceous.
ion: Timber creek, and near Mullica Hill, r Jersey.

ı (Gray) Gabb. (1876.)
Acad. Nat. Sci., Phila., for 1876, p. 302. la., 1876. Wm. M. Gabb.

retacea n. s. Gabb. (1876.)
Acad. Nat. Sci., Phila., for 1876, p. 302. la., 1876. Wm. M. Gabb.
ation: Cretaceous.
ion: Pataula creek, Georgia.

›pygus alabamensis n. s. Clark.)
Hopkins Univ. Cir. vol. 10, No. 87, p. 76. o., 1891. Wm. B. Clark.
ıtion: Cretaceous.
ion: Alabama.

eticrinus alabamensis n. s. De ı (1882.)
Cincinnati Soc. Nat. Hist., vol. 5, p. 118, 5, figs. 1, 1a–c. Cincinnati, 1882. P. De iol.
ıtion: Cretaceous.
on: Livingston, Alabama.

dontes (subgen. Swainson) Meek.)
. S. Geol. Sur. Terr., vol. 9, p. 70. Wash., . F. B. Meek.

meris n. g. Conrad. (1875.)
eol. Sur. N. Carolina, vol. 1. Raleigh, 1875. . Kerr, App. A, p. 6. T. A. Conrad.

ı n. s. Conrad. (1875.)
eol. Sur. N. Carolina, vol. 1. Raleigh, 1875. O. Kerr, App. A, p. 6, pl. 1, fig. 16; pl. 2, 23. T. A. Conrad.
tion: Cretaceous.
on: Snow Hill, Greene county, North Caro-

sphingus n. g. Gabb. (1869.)
Sur. Cal., Paleont., vol. 2, pp. 155, 156. a., 1869. W. M. Gabb.

:tus Gabb. (1869.)
Sur. Cal., Paleont., vol. 2, p. 156. Phila., W. M. Gabb.
tion: Cretaceous.
on: California.

Brachysphingus—Continued.

—— **sinuatus** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 156, pl. 26, fig. 35. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Breviarca n. subgen. Conrad. (1872.)
Proc. Acad. Nat. Sci., Phila., for 1872, p. 55. Phila., 1872. T. A. Conrad.

—— **saffordi** (Gabb.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 87, 88, pl. 12, figs. 11, 12. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Bucardia [Schum.] Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 41, Phila., 1870. T. A. Conrad.

—— **veta** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 41, pl. 1, fig. 2. Phila., 1870. T. A. Conrad.
Formation: Eocene. [Cretaceous.]
Location: Shark river, New Jersey.

Buchiceras (Hyatt) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur., west of 100th meridian, vol. 4, pt. 1, p. 202. Wash., 1875. C. A. White.

—— ? **cornutum** n. s. Whiteaves. (1884.)
Proc. and Trans. Roy. Soc. Canada, vol. 2, sec. 4, pp. 239, 240. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Fort St. John, on the Peace river.

—— **swallovi** (Shum.) White. (1875).
Rep. Geogr. and Geol. Expl. and Sur., west of 100th meridian, vol. 4, pt. 1, pp. 202, 203, pl. 20, figs. 1 *a–c*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Glendale, Long valley, Utah.

Buccinopsis n. g. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 158. Wash., 1857. T. A. Conrad.

—— ? **conradi** n. s. Hill. (1888.)
Ann. Rep. Geol. Sur. Ark. for 1888, vol. 2, pp. 130, 131, pl. 3, figs. 2, 2*a*. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous.
Location: Upper part of the gypsum bluffs of the Little Missouri river, Arkansas.

—— **parryi** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 158, pl. 13, figs. 4*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between Rio San Pedro and Rio Puercos.

Buccinum (Linn.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 96. Phila., 1864. W. M. Gabb.

—— **bicarinatum** (Goldf.) Eichwald. (1871.)
Geog., Paleont., Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 117, 118.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

Buccinum—Continued.

—— **constrictum** H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 411. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.

—— **liratum** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 96, pl. 28, fig. 211. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Clayton, and Marsh's ranch, Contra Costa county, Cal.

—— ? **nebrascensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 67. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau and Fox hills, Nebraska, [S. Dak.].

—— ? **vinculum** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 390, 391, pl. 3, figs. 5*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Great Bend [of the Missouri river].

Bulimina (d'Orb.) Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl., Akad. Wiss. Sitzungsb. 1861, Band XLIV, p. 338, Wien, 1862. A. E. Reuss.

—— **tortilis** n. s. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl, Akad. Wiss. Sitzungsb. 1861, Band XLIV, p. 338, Taf. viii, fig. 3, Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

—— sp. undet. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb. 1861, Band XLIV, p. 338, Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

Bulimnea (subgen. Haldeman) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 532. Wash., 1876. F. B. Meek.

Bulimus limneaformis n. s. (M. & H.). (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 118. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Clark [N. Dakota].

—— **nebrascensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 118. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Clark [N. Dakota].

—— ? **teres** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 117, 118. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union [N. Dakota].

Bulimus—Continued.

—— ? **vermiculus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 118. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union [N. Dakota].

Bulinus (O. F. Müller) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 540. Wash., 1876. F. B. Meek.

—— **atavus** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 86, pl. 24, figs. 5*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Dog creek, a tributary of the Upper Missouri river.

—— **atavus** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 450, pl. 25, figs. 6, 7. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Dog creek.

—— **disjunctus** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 170. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colorado.

—— **disjunctus** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 244. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyoming.

—— **disjunctus** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 86, 87, pl. 24, figs. 6*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colorado, about 10 miles above the confluence of that creek with Platte river.

—— **disjunctus** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 451, pl. 25, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: East of the Rocky mountains, in Colorado.

—— **longiusculus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 541, 542, pl. 43, figs. 16*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Three miles below Fort Union, N. Dakota.

—— **longiusculus** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyoming.

—— **longiusculus** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 87. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Fort Union, on the upper Missouri river.

s—Continued.

ngiusculus (M. & H.) White.
.)
Ann. Rep. U. S. Geol. Sur., p. 451, pl. 25,
8. Wash., 1883. C. A. White.
ation: Cretaceous.
tion: Near Fort Union, N. Dakota.

rhomboideus (M. & H.) Meek.
.)
U. S. Geol. Sur. Terr., vol. 9, p. 542, pl. 43,
17. Wash., 1876. F. B. Meek.
ation: Cretaceous.
ion: Three miles below Fort Union, N. Da-
a.

homboideus (M. & H.) White.
)
th Ann. Rep. U. S. Geol. and Geogr. Sur.
r., pt. 1, p. 87. Wash., 1883. C. A. White.
ation: Cretaceous.
ion: Near Fort Union on the upper Missouri
r.

mboideus (M. & H.) White.
)
Ann. Rep. U. S. Geol. Sur., p. 451, pl. 25,
9. Wash., 1883. C. A. White.
ation: Cretaceous.
on: Near Fort Union, N. Dakota.

elongatus (M. & H.) Meek.
)
. S. Geol. Sur. Terr., vol. 9, pp. 540, 541,
2, figs. 13*a*, *b*. Wash., 1876. F. B. Meek.
tion: Cretaceous.
on: Mouth of Judith river, on the Missouri,
ontana.

elongatus (M. & H.) White.

th Ann. Rep. U. S. Geol. and Geogr. Sur.
., pp. 170, 171. Wash., 1879. C. A. White.
tion: Cretaceous.
n: Crow Creek valley, Colorado.

elongatus (M. & H.) White.

th Ann. Rep. U. S. Geol. and Geogr. Sur.
., p. 243. Wash., 1879. C. A. White.
tion: Cretaceous.
n: Near Mellis Station, Wyoming.

elongatus (M. & H.) White.

Ann. Rep. U. S. Geol. and Geogr. Sur.
, pt. 1, p. 87. Wash., 1883. C. A. White.
ion: Cretaceous.
n: Upper Missouri River region.

elongatus (M. & H.) White.

Ann. Rep. U. S. Geol. Sur., p. 450, pl. 25,
10, 11. Wash., 1883. C. A. White.
ion: Cretaceous.
n: Mouth of Judith river, Montana.

inn.) Morton. (1834.)
Org. Rem. Cret. Gr. U. S., p. 46. Phila.,
S. G. Morton.

Bulla—Continued.

—— **hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 143, pl. 29, fig. 235. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

—— **macrostoma** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 301, 302, pl. 48, fig. 16 [15]. Phila., 1858-1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Prairie Bluff, Alabama.

—— **minor** n. s. (M. & H.) (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 69. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post [S. Dakota].

—— **mortoni** n. s. Forbes. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, p. 63, fig. *a*. London, 1845. Edward Forbes.
Formation: Cretaceous.
Location: New Jersey.

—— **occidentalis** n. s. (M. & H.) (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 69. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river.

—— **recta** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 302, pl. 48, fig. 17 [16]. Phila., 1858-1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, New Jersey.

—— **subcylindrica** n. s. (M. & H.) (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 270 Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Near mouth of Milk river, Nebraska [Montana].

—— **volvaria** n. s. (M. & H.) (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 69. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, [S. Dakota].

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 46. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Alabama.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 46. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

——? Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 282. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location: [New Jersey?]

Bullia (Gray) Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 156. Phila., 1869. W. M. Gabb.

—— **(Molopophorus) striata n. s., Gabb.** (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 157, pl. 26, fig. 36. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

Bullopsis n. g. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d. ser.. 1855-1858, p. 334. Phila., 1855-1858. T. A. Conrad.

—— **cretacea n. s.** Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 334. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, 3 miles north of the town of Ripley, Miss.

Busycon ? blakei n. s. Conrad. (1855.)
Rep. Expl. and Sur. R. R. R., Miss. River to Pacific ocean, App. Prelim., Geol. Rep. of W. P. Blake, Pal., p. 11. Wash., 1855. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada de las Uvas.

—— **? blakei** Conrad. (1856.)
Rep. Expl. and Sur. R. R. R., Miss. River to Pacific ocean, vol. 5, App., p. 322, pl. 2, fig. 13. Wash., 1856. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada do las Uvas.

Callianassa (Leach) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 57. Phila., 1864. W. M. Gabb.

—— **antiqua** (Otto) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 241, 242. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Middletown, New Jersey.

—— **danai n. s.** H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., n. s., vol. 5, pp. 379, 380, pl. 1, figs. 1*a*, *b*. Cambridge and Boston, 1855 Hall & Meek.
Formation: Cretaceous.
Location: Great Bend of the Missouri.

—— **stimpsonii n. s.** Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 57, pl. 9, figs. 1*a*–*c*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Chico creek; Clayton, Contra Costa county; Near Cañada de las Uvas, California.

—— **stimpsonii** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 127, pl. 19, fig. 8. Phila, 1864. W. M. Gabb.
Formation: Cretaceous.

—— **ulrichi n. s.** White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, pp. 161, 162, Wash., 1880, Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous [Tertiary.].
Location: Near Little Rock, Arkansas.

Callianassa—Continued.

—— **ulrichi** White. (1881.)
Proc. U. S. Nat. Mus., vol. 4, p. 137, pl. 1, figs. 10 and 11. Wash., 1881, Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

Callista (Poli) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858-1860, p. 282. Phila., 1858-1860. T. A. Conrad.

—— (Poli) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 178. Wash., 1876. F. B. Meek.

—— **delawarensis** (Gabb) Whitfield, (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 153, 154, pl. 22, figs. 8-10. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold, Marlboro, and Holmdel, New Jersey.

—— **deweyi** M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 443. Phila., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Deer creek, a tributary of the north branch of Platte river, Nebraska.

—— **deweyi** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 183. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek and Fossil ridge, Colorado.

—— **eufaulensis n. s.** Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 282, pl. 46, fig. 24. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Alabama.

—— **? pellucida** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 187, 188, pl. 17, figs. 10*a*–*e*, 12*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Two hundred miles above the mouth of Milk river [Montana].

—— (?) **subtrigona n. s.** Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 63, 64, pl. 9, fig. 10. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte Islands.

—— **(Aphrodina ?) tenuis** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 188, 189, pl. 5, figs, 1*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: South fork of Cheyenne river, near the base of Black hills.

—— **(Dosiniopsis ?) orbiculata** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 186, 187, pl. 5, figs. 2*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Five miles below the mouth of James river [S. Dakota].

sta—Continued.

(Dosiniopsis) owenana (M. & H.) ek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, pp. 183, 184, pl. 7, fig. 1. Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: Mouth of Judith river [Montana].

(Dosiniopsis) nebrascensis (M. & Meek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, pp. 184–186, igs. 15-17, p. 184. Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: On Cheyenne and Moreau rivers; Deer reek, on the North Platte river [S. Dakota].

(Dosiniopsis?) deweyi (M. & H.) ek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, pp. 182, 183, l. 17, figs. 15*a*–*e*. Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: Moreau river, and on the Yellowstone iver.

Dosiniopsis) deweyi (M. & H.) iteaves. (1885.)
ol. and Nat. Hist. Sur. Can.; Cont. Can. aleont., vol. 1, pt. 1, pp. 42, 43, pl. 6, figs. 4, 5, *a*. Montreal, 1885. J. F. Whiteaves.
rmation: Cretaceous.
cation: Bull's Head, about twenty-two miles vest of the west end of the Cypress hills; hills outh of Big Plume creek, township 8, range 5, vest of 4th principal meridian, Canada.

?) sp. undet. Whiteaves. (1876.)
l. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 64, 5, pl. 9, fig. 11. Montreal, 1876. J. F. Vhiteaves.
mation: Cretaceous.
ation: Queen Charlotte islands.

stoma (Swains.) Gabb. (1869.)
l. Sur. Cal., Paleont., vol. 2, p. 170. Phila., 869. W. M. Gabb.

onstrictum n. s. Whiteaves. (1884.)
l. and Nat. Hist. Sur. Can., Mes. Foss., vol. , pt. 3, p. 217, pl. 28, figs. 4, 4*a*. Montreal, 884. J. F. Whiteaves.
mation: Cretaceous.
ation: East end of Maud island, opposite eading island.

adiatum n. s. Gabb. (1869.)
l. Sur. Cal., Paleont., vol. 2, pp. 170, 171, pl. 8, fig. 53. Phila., 1869. W. M. Gabb.
mation: Cretaceous.
ation: Texas Flat, Placer county, Cal.

arca (subgen. Gray) Meek. (1876.)
. U. S. Geol. Sur. Terr., vol. 9, p. 78. Wash., 876. F. B. Meek.

nema n. g. Conrad. (1875.)
. Geol. Sur. N. Carolina, vol. 1. Raleigh, 875. W. C. Kerr, App. A, p. 12. T. A. Cond.

Callonema—Continued.

—— bella n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr, App. A, p. 12. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr, App. A, p. 12, pl. 2, fig. 27. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

Calobates (subgen. Gould) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol, 9, p. 261. Wash., 1876. F. B. Meek.

Camaena (subgen. Albers) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 550. Wash., 1876. F. B. Meek.

Campeloma (Raf.) Meek. (1877.)
Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, p. 179. Wash., 1877. F. B. Meek.

—— macrospira Meek? (1877.)
Rep. Geol. Expl. 40th parallel, vol. 4, pt. 1, pp. 179–180, pl. 17, figs. 17*a*, *b*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Sulphur creek, on Bear river, Wyoming.

—— macrospira (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 245–246. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— macrospira (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 102, pl. 30, fig. 2*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, southwestern Wyoming.

—— macrospira (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 469, pl. 8, figs. 6–7. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming.

—— multilineata (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 586, 587, pl. 44, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fort Clarke, N. Dakota, on the Missouri.

—— multilineata (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 101. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Campeloma—Continued

—— multilineata (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 469, pl. 27, figs. 1–7. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Near Fort Clarke, in the valley of the Upper Missouri.

—— multilineata (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont. vol. 1, pt. 1, p. 77. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Belly river, east side of Driftwood bend, and South Saskatchewan, six miles below the mouth of Bow river; north side of Milk river, five miles below Pā-kow-kī coulée, Canada.

—— multistriata (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 588, 589, pl. 43, figs. 15a–e, fig. 80, p. 588. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Fort Clarke, N. Dakota, on the Missouri river; near mouth of Yellowstone river, Montana.

—— multistriata (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 173. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Crow Creek valley, Colorado.

—— multistriata (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 221, 222. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Black Buttes station, Wyoming.

—— multistriata (M. & H.) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, p. 101. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— multistriata (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 469, pl. 27, fig. 15. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Near Fort Clarke, in the valley of the Upper Missouri.

—— producta n. s. White. (1882.)

Proc. U. S. Nat. Mus., vol. 5, p. 97, pl. 3, figs. 7–9. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of Yellowstone river, Montana.

—— producta (White). (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 469, pl. 26, figs. 21–27. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of the Yellowstone river.

—— producta (White) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 24. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Three Hills creek, township 30, range 23, west of 4th principal meridian, Canada.

Campeloma—Continued.

—— producta (White) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 28. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Wood End depot, Souris river, and "Great Valley," about one hundred miles west of Wood End, on the 49th parallel; Short creek, Souris river, Canada.

—— producta (White) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont, vol. 1, pt. 1, p. 77. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: South Saskatchewan, one mile below the mouth of Bow river, Canada.

—— vetula (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 587–588, pl. 44, figs. 14a, b. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Judith river, Montana.

—— vetula (M. & H.) White. (1879).

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 210. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Yampa valley, near Cañon park, Colorado.

—— vetula (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 221. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Black Buttes station, Wyoming.

—— vetula (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 216. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Point of Rocks station, Wyoming.

—— vetula (M. & H.) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, p. 101. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— vetula (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 469, pl. 27, figs. 8–9. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region; Black Buttes, Wyoming.

Campeloma sp. undet. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 181, pl. 17, figs. 15a, b, and 16a–c. Wash., 1877. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Sulphur creek, on Bear river, Wyoming.

—— (Melantho) macrospira n. s. Meek. (1871).

Proc. Acad. Nat. Sci., Phila., for 1871, pp. 181–182. Phila., 1871. F. B. Meek.

Formation: Cretaceous.

Location: Gilmore, Wyo.; Bear river, near the mouth of Sulphur creek, Utah [Wyoming]; various localities in the Bear river country.

eloma—Continued.

(Melantho) macrospira Meek.
(1877.)
. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1,
p. 180-181. Wash., 1877. F. B. Meek.
mation: Cretaceous.
ation: Mouth of Sulphur creek, on Bear river,
yoming.

tonectes n. g. Agassiz MS. (1864.)
ck List Invert. Foss. N. Am. Cret. and Jur.,
mithson. Misc. Coll., vol. 7, No. 177, p. 39.
ash., 1864. F. B. Meek.

rgillensis Conrad. (1869.)
. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 99.
hila., 1870. T. A. Conrad.
mation: Cretaceous.

ellisculptus n. s. Conrad. (1869.)
. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 99,
. 9, fig. 11. Phila., 1870. T. A. Conrad.
mation: Cretaceous.
ation: Haddonfield, N. J.

ellistriatus. Meek. (1864.)
ck List Invert. Foss. N. Am. Cret. and Jur.,
nithson. Misc. Coll., vol. 7, No. 177, p. 39.
ash., 1864. F. B. Meek.
mation: Jurassic.
ation: Idaho.

ellistriatus (Meek) M. & H.
(1865.)
ont. Up. Missouri, Smithson. Cont. Knowl.,
l. 14, No. 172, pp. 77, 78, figs. *a–d*, text.
ash., 1865. Meek & Hayden.
nation: Jurassic.
tion: Red Buttes and below there on the
rth branch of Platte river, Dakota [Wyo-
ing].

ellistriatus (M. & H.) White.
1875.)
. Geogr. and Geol. Expl. and Sur. west of
e hundredth Meridian, vol. 4, pt. 1, p. 165.
ash., 1875. C. A. White.
nation: Jurassic.
tion: Five miles east of Gunnison, Utah.

ellistriata Meek. (1876.)
Expl. Great Basin Terr. Utah, pp. 356, 357,
3, figs. 3*a–d*. Wash., 1876. F. B. Meek.
nation: Jurassic.
tion: Near the Red Buttes, on the North
atte [Wyoming].

ellistriatus (Meek) H. & W.
.)
Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp.
–290, pl. 7, fig. 13. Wash., 1877. Hall &
hitfield.
nation: Jurassic.
tion: Northwest of Rawlings station, Wyo-
ng, and from Sheep creek, and Flaming Gorge,
nta range, Utah.

ellistriatus (Meek) Whitfield.
.)
Geol. Black hills of Dakota, pp. 351–353, pl.
figs. 6–11. Wash., 1880. R. P. Whitfield.
ation: Jurassic.
tion: Near Bear Lodge, on the Belle Fourche
er; on Spearfish creek; in Redwater valley,
d in the Big Horn mountains.

Camptonectes—Continued.

—— **burlingtonensis** (Gabb) Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 76. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.

—— **burlingtonensis** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 318. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **curvatus** (Geinitz) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss, vol. 1, pt. 3, p. 242, pl. 32, fig. 4. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud Island.

——? **extenuatus** (M. & H.) (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 78, pl. 3, fig. 6. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: North Platte, below Red Buttes, Dakota [Wyoming]; and southwest base of Black Hills.

—— **extenuatus** (Meek) H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 290, 291, pl. 7, fig. 18. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Northwest of Rawlings station, Wyoming.

——? **extenuatus** (M. & H.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser. No. 7, pp. 401, 402. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

——? **extenuatus** (M. & H.) Whiteaves. (1878.)
Geol. Sur. Canada; Rep. Prog., for 1876–'77, pp. 151, 152. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— **extenuatus** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black hills of Dakota, pp. 353, 354, pl. 4, figs. 4, 5. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: East of the Belle Fourche river, near Bear Lodge, Black hills.

—— **pertenuistriatus** n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 291, 292, pl. 7, fig. 17. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Northwest of Rawlings station, Wyoming.

Camptonectes—Continued.

—— platessa n. s. White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur., West of 100th Merid, G. M. Wheeler, p. 25. Wash., 1874. C. A. White.
Formation: Cretaceous.
Location: Fifty miles north of Camp Apache and five miles west of Mineral Spring, Arizona.

—— platessa White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of 100th Meridian, vol. 4, pt. 1, p. 176, pl. 17, fig. 5a. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Fifty miles north of Camp Apache and five miles west of Mineral Spring, Arizona.

—— platessiformis White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 143, 144, pl. 37, fig. 5a. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Aquarius plateau, southern Utah.

—— parvus n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 55, pl. 8, figs. 1 and 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold, New Jersey.

—— stygius n. s. White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur. west of 100th Merid., G. M. Wheeler, p. 23. Wash., 1874. C. A. White.
Formation: Jurassic.
Location: "Edge of the bluff, fifteen to twenty miles south of Dirty Devil river and upon the north fork of Virgin river, Utah."

—— stygius White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of 100th Meridian, vol. 4, pt. 1, pp. 164–165, pl. 13, figs. 2a–c. Wash., 1875. C. A. White.
Formation: Jurassic.
Location: East of Aquarius plateau, fifteen to twenty miles south of Dirty Devil river, and also at the North fork of Virgin river, Utah.

—— (Amusium) burlingtonensis (Gabb) Whitfield. (1884.)
Mon. U. S. Geol. Sur., vol. 9, pp. 53–55, pl. 8, figs. 3–9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield and Holmdel, New Jersey.

—— ? sp. undet. Whiteaves. (1877.)
Geol. Sur. Can.; Rep. Prog. for 1875–1876, app. II, p. 96. Montreal, 1877. J. F. Whiteaves.
Formation: Jurassic or Cretaceous.
Location: Rock Island gates, below Hudson's Hope, Peace river.

Cancellaria (Lam.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 390. Phila., 1858–1860. Wm. M. Gabb.

—— alabamensis n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 301, pl. 48, fig. 14. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Prairie Bluff, Alabama.

Cancellaria—Continued.

—— eufaulensis n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 390, 391, pl. 68, fig. 8. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Alabama.

—— septemlirata n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 94, pl. 2, fig. 10. Phila., 1861. Wm. M. Gabb.
Formation: Cretaceous.
Location: Mullica Hill, New Jersey.

—— subalta n. s. Conrad. (1869.)
Am. Jour. Conch., vol 5, Phila., 1869, 1870, p. 100, pl. 9, fig. 22. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, New Jersey.

—— turneri n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 25, pl. 3, figs. 6 and 7. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Martinez, Contra Costa county, Cal.

Cancer (Linn.) Morton. (1830.)
Am. Jour. Sci., 1st. ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— sp. undet. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 74. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Sandy Hook [N. J].

Candona? emmonsii n. s. Jones. (1862.)
Paleontographical Society, pp. 125–126, fig. 12, in text. London, 1862. T. R. Jones.
Formation: Triassic ?
Location: Phœnixville, Pa.

—— ? rogersii n. s. Jones. (1862.)
Paleontographical Society, pp. 124, 125, pl. 5, figs. 20–22. London, 1862. T. R. Jones.
Formation: Triassic ?
Location: Culpeper and Prince Edward counties, Virginia; Deep river, North Carolina; Phœnixville, Pa.

Cantharulus subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 378. Wash., 1876. F. B. Meek.

Cantharus (Bolten) Meek. (1876.).
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 377–379. Wash., 1876. F. B. Meek.

—— ? julesburgensis n. s. White. (1881.)
Proc. U. S. Nat. Mus., vol. 4, p. 138, pl. 1, figs. 1 and 2, Wash., 1881, Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous.
Location: Vicinity of Julesburg, Colo.

harus—Continued.

Cantharulus) vaughani (M. & H.)
ɜk. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, pp. 379, 380,
l. 32, figs. 5a, b, fig. 48, p. 379. Wash., 1876.
'. B. Meek.
:mation: Cretaceous.
:ation: Near the mouth of Heart river, on the
'pper Missouri.

hyria (subgen. Swain.) Meek.
76.)
p. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash.,
876. F. B. Meek.

ına (d'Orb.) Conrad. (1855.)
c. Acad. Nat. Sci., Phila, for 1854, 1855, p.
68. Phila., 1856. T. A. Conrad.

rassifibra n. s. Roemer. (1849.)
as, pp. 408, 409. Bonn, 1849. F. Roemer.
mation: Cretaceous.
:ation: Near Waco camp, above New Braun-
els, and on Pedernales and San Saba rivers,
'exas.

rassifibra Roemer. (1852.)
ide. von Texas, p. 79, Taf. 5, figs. 6a–f. Bonn,
852. F. Roemer.
mation: Cretaceous.
:ation: Waco camp on the Guadalupe, above
lew Braunfels, upper course of Pedernales
iver, and San Saba valley, Texas.

;uadalupae n. s. Roemer. (1849.)
as, p. 408. Bonn, 1849. F. Roemer.
mation: Cretaceous.
:ation: Waco camp, above New Braunfels, Tex.

;uadalupae Roemer. (1852.)
ide. von Texas, pp. 79, 80, Taf. 5, figs. 4a, b.
onn, 1852. F. Roemer.
mation: Cretaceous.
ation: Waco camp, on the Guadalupe, above
'ew Braunfels, Tex.

ccidentalis n. s. Conrad. (1855.)
c. Acad. Nat. Sci., Phila., for 1854, 1855, p.
38. Phila., 1856. T. A. Conrad.
mation: Cretaceous.
ation: Near the mouth of Puercos river,
'exas.

ccidentalis Con. (1857.)
. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p.
17, pl. 2, fig. 1–ac. Wash., 1857. T. A. Con-
d.
mation: Cretaceous.
ation: Near the mouth of Puercos river.

lanata n. s. Conrad. (1855.)
c. Acad. Nat. Sci., Phila., for 1854, 1855, p.
58. Phila., 1856. T. A. Conrad.
mation: Cretaceous.
ation: Oak creek, near Puercos [Texas].

lanata Con. (1857.)
. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p.
17, pl. 2, figs. 2a, b. Wash., 1857. T. A.
onrad.
mation: Cretaceous.
ation: Oak creek, near Puercos.

Caprina—Continued.

—— quadrata n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 266. Phila., 1856. T. A. Conrad.
Formation: Cretaceous.
Location: Alabama.

—— ? texana n. s. Roemer. (1849.)
Texas, p. 409. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Near Waco camp, slope of plateau near Braunfels and on road from New Braunfels to Fredericksburg, Tex.

—— sp. undet. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Mission Station, N. P. R. R.

Caprinella coraloidea n. s. H. & M. (1854.)
Mem. Am. Acad. Arts. and Sci., n. s., vol. 5, pp. 380-381, pl. 2, figs. 3a–f. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek, Nebr.

Caprotina (d'Orb.) Meek. (1876.)
Rep. Expl. Exped. Santa Fe, N. Mex., to junction of Grand and Green rivers, p. 126. Wash., 1876. F. B. Meek.

—— texana Roemer. (1852.)
Kreide. von Texas, p. 80, Taf. 5, figs. 2a–c. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Highlands between New Braunfels and Fredericksburg, Tex.

—— texana (Roem.) Marcou. (1858.)
Geol. N. Am. p. 42. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Hills surrounding Comet creek, on the left bank of the False Washita.

—— (Requienia ?) bicornis n. s. Meek. (1876.)
Rep. Expl. Exped. Santa Fe, N. Mex., to junction of Grand and Green rivers, p. 126, pl. 1, figs. 7a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fort Lancaster, Texas.

Capsa (Lam.) Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 164. Wash., 1857. T. A. Conrad.

—— texana n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 164, pl. 21, fig. 6. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon Springs [Texas].

Capulus fragilis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 68. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Fox hills, Nebraska [S. Dakota].

Capulus—Continued.

—— **occidentalis** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 385, 386, pl. 1, figs. 13*a*–*d*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek, Nebraska [Wyoming].

Cardiaster (Forbes) d'Orb.

Paleont. Française, Echinoides Irreguliers, Terr. Crét., t. 6, pp. 123, 124. Paris, 1853–1860. A. d'Orbigny.

—— (Forbes) Desor. (1858.)

Synop. Echinides Foss., p. 344. Paris and Wiesbade, 1858. E. Desor.

—— **cinctus** (Mort.) d'Orb. (1854.)

Paleont. Française Echinoides Irreguliers, Terr. Crét., t. 6, p. 147, pl. 905, fig. 4. Paris, 1853–1860. A. d'Orbigny.
Formation: Cretaceous.
Location: New Jersey.

—— **cinctus** (Morton) Desor. (1858.)

Synop. Echinides Foss., p. 346. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: New Jersey.

—— **fimbriatus** (Mort.) d'Orb. (1854.)

Paleont. Française Echinoides Irreguliers, Terr. Crét., t. 6, pp. 146, 147, pl. 905, fig. 3. Paris, 1853–1860. A. d'Orbigny.
Formation: Cretaceous.
Location: New Jersey.

Cardinia (Agass.) Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 13. Phila., 1870. Wm. M. Gabb.

—— ? **ponderosa** n. s. Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 13, pl. 6, fig. 11, 11*a*. Phila., 1870. Wm. M. Gabb.
Formation: Triassic.
Location: New pass, near Austin [Nevada].

—— **praecisa** n. s. White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, pp. 149, 150, pl. 37, figs. 7*a*, *b*. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Near the lower cañon of Yellowstone river, Montana.

—— ? **triangularis** n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, p. 179, Taf. 16, figs. 21, 22. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— ? **sp. undet.** Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 428. Phila., 1871. F. B. Meek.
Formation: Jurassic.
Location: Salinas creek, Hot Springs.

Cardita (Brug.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 66. Phila., 1834. S. G. Morton.

Cardita—Continued.

—— ? **alticosta** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont. vol. 2, p. 268, pl. 36, fig. 16. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **decisa** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 292 (pl. 9, fig. 3, [vol. 24]). New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: St. Georges, Del.

—— **decisa** Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, pl. 9, fig. 3. New Haven, 1833. S. G. Morton.
[Described in vol. 23.]

—— **decisa** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 66, pl. 9, fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: St. Georges, Del.

—— **eminula** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 160, pl. 6, fig. 8. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon springs [Texas.]

—— **hornii** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 174, pl. 24, fig. 157. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Martinez, near Clayton, Cal.

—— **hornii** Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 187, 188, pl. 30, figs. 83, 83*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon; Martinez; Clayton; near New Idria, and west of Griswold's, on the road from the latter place to San Juan, Cal.

—— **intermedia** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 209, pl. 28, figs. 14, 15. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Farmingdale, N. J.

—— **planicosta** (Lam.) Conrad. (1855.)

Rep. Expl. and Sur. P. R. R. Miss. River to Pacific Ocean. App. Prelim. Geol. Rep. of W. P. Blake, Pal., p. 10. Wash., 1855. T. A. Conrad.
Formation: Eocene [Cretaceous.]
Location: Cañada de las Uvas [California].

—— **planicosta** (Lam.) Conrad. (1856.)

Rep. Expl. and Sur. P. R. R. Miss. River to Pacific Ocean, vol. 5, App. p. 321, pl. 2, fig. 6. Wash., 1856. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Canada de las Uvas.

—— **subtetrica** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 164, pl. 21, fig. 5. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Rio Bravo del Norte [Texas].

ta—Continued.

ubquadrata n. s Gabb. (1860.)

c.Acad. Nat. Sci. Phila., vol. 4, 2d. ser., 1858–
60, p. 303, pl. 48, fig. 22*a*, *b*. [21*a*, *b*]. Phila.
58–1860. Wm. M. Gabb.
nation: Cretaceous.
ation: Burlington county, New Jersey.

ıbquadrata ? Gabb. (1860.)

. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–
60, p. 395. Phila., 1858–1860. Wm. M. Gabb.
nation: Cretaceous.
ation: Hardeman county, Tennessee.

ım (Linn.) Morton. (1834.)

p. Org. Rem. Cret. Gr. U. S., p. 66. Phila.,
34. S. G. Morton.

inn.) Meek. (1876.)

U. S. Geol. Sur. Terr., vol. 9, p. 166. Wash.,
76. F. B. Meek.

ruptum n. s. Gabb. (1860.)

. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–
0, p. 302. Phila., 1858–1860. Wm. M. Gabb.
nation: Cretaceous.
tion: "Near Purdy," Tenn.

caeformis n. s. Gabb. (1869.)

Jour. Conch., vol. 5, Phila., 1869, 1870, pp.
12, pl. 3, fig. 9. Phila., 1870. Wm. M. Gabb.
ation: Jurassic.
tion: Volcano, about thirty miles southeast
Walker's lake, Nevada.

kansense n. s. Conrad. (1855.)

. Acad. Nat. Sci., Phila., for 1854, 1855, p. 266.
ila., 1856. T. A. Conrad.
ation: Cretaceous.
tion: Arkansas.

llulum n. s. Meek. (1876.)

Expl. Exped. Santa Fe, New Mexico, to
ction of Grand and Green rivers, pp. 128–
, pl. 2, figs. 6*a*, *b*. Wash., 1876. F. B. Meek.
ation: Cretaceous.
tion: Rio de la Plata [Colorado].

azoense n. s. Shumard. (1859.)

s. Acad. Sci., St. Louis, vol. 1, 1856–1860, p.
. St. Louis, 1856–1860. B. F. Shumard.
ation: Cretaceous.
tion: Johnson county, at Comanche Peak, a
feet above the level of Brazos river, and
r Patrick's creek, Parker county, Texas.

ewerii n. s. Gabb. (1864.)

Sur. Cal., Paleont, vol. 1, p. 175, pl. 24, fig.
. Phila., 1864. Wm. M. Gabb.
ation: Cretaceous.
ion: East of the north end of Cañada de las
s; around Martinez, Cal.

**octawense n. s. Shumard.
.)**

. Acad. Sci., St. Louis, vol. 1, 1856–1860, p.
. St. Louis, 1856–1860. B. F. Shumard.
ation: Cretaceous.
ion: Post-Oak creek, Grayson county, Texas.

Cardium—Continued.

—— choctawense (Shumard) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 39, pl. 18, figs. 7*a–c*. Wash., 1883. C. A. White.

—— coloradoense n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 599, 600. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Burnet, Travis, Bosque, Johnson, and McLennan counties, and several hundred miles further westward, Texas.

—— congestum n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 149, pl. 6, figs. 5*a–d*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Rio San Pedro [Texas].

—— cooperii n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 172, pl. 24, figs. 154, 154*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, San Diego, near Cañada de las Uvas, Cal.

—— cooperi (Gabb) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, p. 176, Taf. 16, figs. 3, 4. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— curtum (M. & H.?) Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 151, 152, pl. 15, fig. 3 (not 3*a*). Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Chalk creek, two miles west of Uptown, Utah.

—— curtum (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— curtum (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 249. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyoming.

—— decoratum (Grew.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 129, 130. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula, Kadiak, Unga, and Atcha islands.

—— dumosum n. s. Conrad. (1870.)

Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 75. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— elegantulum n. s. Roemer. (1849.)

Texas, pp. 405, 406, Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall, near New Braunfels, Tex.

Cardium—Continued.

—— **elegantulum** Roemer. (1852.)
Kreide. von Texas, pp. 48, 49, Taf. 6, figs. *5a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— **eufaulense** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 282, pl. 46, fig. 12. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss., and Eufaula, Ala.

—— **eufaulensis** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 132, pl. 20, figs. 17–19. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, N. J.

—— **guerangeri** (d'Orb.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 128, 129. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

—— **hemicyclicus** n. s. Tuomey. (1854.)
Proc. Acad. Nat. Sci., Phila. 1856. M. Tuomey.
Formation: Cretaceous.
Location: Alabama.

—— **hillanum** (Sow.) Roemer. (1849.)
Texas, p. 406. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba river, Texas.

—— **hillanum** (Sow.) Roemer. (1852.)
Kreide. von Texas, p. 49, Taf. 6, fig. 12. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba valley, Texas.

—— **inbricatarium** (Leym.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 175, 176. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous
Location: Alaska.

—— **kansasense** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geog. Sur. Terr., pp. 307, 308. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

—— ? **kansasense** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 170, 171, pl. 2, figs. *14a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

Cardium—Continued.

—— **kansasense** (Mk.) Cragin. (1889.)
Bull. Washb. Col. Lab. Nat. Hist., vol. 2, No. 10, p. 67. Topeka, 1889. F. W. Cragin.
Formation: Cretaceous.
Location: Kiowa, Comanche, Bavaria, and Ellsworth counties, Kansas.

—— **lamarensis** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 600, 601. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Lamar county, Texas.

—— **linteum** n. s. Conrad. (1855.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean, App. Prelim. Geol. Rep. of W. P. Blake, Pal. p. 9. Wash., 1855. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada de las Uvas.

—— **linteum** Conrad. (1856.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean, vol. 5, App., p. 320, pl. 2, fig. 1. Wash., 1856. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location. Cañada de las Uvas.

—— **mediale** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 149, pl. 4, figs. *4a–b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location:—— [Texas].

—— **multistriatum** n. s. Shumard. (1853.)
Expl. Red river, Louisiana, by R. B. Marcy, p. 207. pl. 4, fig. 2. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Camp No. 4, Cross Timbers. Tex,

—— **multistriatum** (Shum.) Schiel. (1855.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean, vol. 2; Rep. Expl. Forty-first Parallel N. Lat., p. 109, pl. 1, fig. 10. Wash., 1855. James Schiel.
Formation: Cretaceous.
Location: Upper Green river.

—— **multiradiatum** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 395, pl. 68, fig. 29. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **pauperculum** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 306. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Oil Springs, twenty miles west of Fort Bridger, Wyo.

—— **pauperculum** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 291, pl. 9, fig. *3a*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Oil Springs, twenty miles west of Fort Bridger, Wyo.

Cardium—Continued.

—— **pedernalis** n. s. Roemer. (1849.)
Texas, p. 406, Bonn., 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **pertenue** n. s. M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 442. Phila., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Deer creek, near the north branch of Platte river, Nebraska [Wyoming].

—— **protextum** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275, pl. 24, fig. 12. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Burlington county, New Jersey.

—— **remondianum** n. s. Gabb. (1864.)
Geol. Sur. Cal., Palaeont., vol. 1, p. 172, pl. 23, fig. 153. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Benicia, "Wright's Gulch," near Shasta City, Cal.

—— **ripleyanum** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 96, pl. 9, fig. 6. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **ripleyanum** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 132, 133, pl. 20, fig. 14. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Keyport, N. J.

—— **ripleyense** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 326. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **rarum** n. s. E. & S. (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 39. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: On Moreau and Grand rivers [S. Dakota].

—— ? **sancti-sabæ** n s. Roemer. (1849.)
Texas, p. 405. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and old Spanish fort on San Saba river, Texas.

—— **sancti-sabæ** Roemer. (1852.)
Kreide. von Texas, p. 48, Taf. 6, figs. 7*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and Spanish fort on San Saba river, Texas.

—— **scitulum** n. s. Meek. (1858.)
Trans. Albany Inst., vol., 4, pp. 40, 41. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

Cardium—Continued.

—— ? **sevieriensis** n. s. Hill. (1888.)
Ann. Rep. Geol. Sur. Ark. for 1888, vol. 2, pp. 134, 135, pl. 2, figs. 21, 21*a*. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous.
Location: Near Murfreesboro, Ark.

—— **shumardi** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 182, 183. Phila., 1861. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills, Nebraska [Wyoming].

—— **speciosum** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 274, 275. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Bad Lands of Judith river, Nebraska [Montana].

—— **speciosum** (M. &. H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 182, 183. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fossil ridge; mouth of St. Vrains creek; valleys of the Cache à la Poudre and Little Thompson creeks, Colorado.

—— **speciosum** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— **speciosum** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 225. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near White River Indian agency, Colorado.

—— **speciosum** (M. & H.?) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 229. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Dodd's ranch on Ashley's fork, Utah.

—— **spillmani** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 326, pl. 34, fig. 3. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of town of Ripley, Miss.

—— **subcurtum** Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 152, 153, pl. 15, fig. 3*a* (not fig. 3). Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Chalk hill, near Coalville, Utah; between Coalville and Weber Cañon.

—— **subcurtum** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Cardium—Continued.

—— **subcurtum** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 250. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyo.

—— **subquadratum** n. s. E. & S. (1857.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 38, 39. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Moreau river [S. Dakota].

—— **tippanum** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 326, pl. 34, fig. 8*b*. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **transversale** n. s. Roemer. (1849.)

Texas, p. 406. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **trite** n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 291, 292, pl. 5, figs. 4*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Head of Waterpocket cañon, southern Utah.

—— **trite** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— **tumidulum** n. s. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 249, 250, pl. 33, fig. 4. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

—— (**Adacna**)? sp. undet. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 58, pl. 9, fig. 4. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Palace Camp, Washington.

—— (**Criocardium**) **dumosum** (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 133–135, pl. 20, figs. 9–13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— (**Criocardium**) **multiradiatum** (Gabb.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 135, 136, pl. 21, figs. 1–3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, Monmouth, Freehold, and Burlington, N. J.

—— (**Criocardium**) **speciosum** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 169, 170, pl. 37, figs. 4*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river; on Cache La Poudre river, Colorado.

Cardium—Continued.

—— (**Granocardium**) **sabulosum** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 267, pl. 36, fig. 14. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— (**Granocardium**) **tippanum** (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 310. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Georgia.

—— (**Hemicardium** ?) **curtum** n. s. M. & H. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 442. Phil., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Head Gros Ventres river, Nebraska [Wyoming].

—— (**Lævicardium**) **annulatum** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 171, pl. 23, fig. 152. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Curry's, south side of Mount Diablo, California.

—— (**Lævicardium**) **annulatum** Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 187, pl. 30, fig. 81. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, south of Mount Diablo, and in Orestimba cañon, California.

—— (**Protocardium**) **filosum** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 150, pl. 6, figs. 7*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon Springs, Texas.

—— (**Protocardium**) **granuliferum** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 267, 268, pl. 36, fig. 15. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— (**Protocardia**) **linteum** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 278, 279, pl. 46, fig. 17. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula [Alabama]; Tippah county, Alabama [Mississippi].

—— (**Protocardia**) **multistriatum** (Shum.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 149, pl. 6, figs. 4*a*–*c*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon Springs [Texas].

Cardium—Continued.

—— **(Protocardium) perelongatum** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 136–138, pl. 20, figs. 20, 21, pl. 21, figs. 4, 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Cream Ridge and Mullica Hill, New Jersey.

—— **(Protocardium) placerensis** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 173, pl. 24, fig. 156. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas Flat, Placer county, California.

—— **(Protocardia) salinaense** n. s. Meek. (1871.)

Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 306, 307. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

—— **(Protocardia) texanum** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 150, pl. 6, figs. 6*a–c*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between El Paso and Frontera.

—— **(Protocardium) translucidum** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 187, pl. 30, figs. 82, 82*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, south of Mount Diablo, California.

—— **(Trachycardium) alabamense** n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 310. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.

—— **(Trachycardium) carolinensis** n. s. Conrad. (1875.)

Rep. Geol. Sur. N. Carolina, vol. 1; Raleigh, 1875, W. C. Kerr, App. A, p. 7, pl. 2, fig. 1. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— **(Trachycardium) carolinense** (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 310. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Georgia.

—— **(Trachycardium eufaulense)** (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 310. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Quitman county, Georgia.

Cardium—Continued.

—— **sp. undet.** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

—— **sp. undet.** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 66. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **sp. undet.** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 66. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **sp. undet.** Roemer. (1849.)

Texas, p. 406. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **sp. undet.** Roemer. (1849.)

Texas, p. 406. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide. von Texas, p. 50. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide. von Texas, p. 49. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide. von Texas, p. 49. Bonn, 1852. F. Roemer.
Formation; Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide. von Texas, p. 50. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **sp. undet.** Owen. (1860.)

Second Rep. Geol. Rec. Arkansas, pl. 7, fig. 2. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— **sp. undet.** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 292, pl. 9, figs. 2*a–c*. Wash., 1879. C. A. White.
Formation: Cretaceous.

Caryatis (Roem.) Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 185, 186. Phila., 1869. W. M. Gabb.

—— **nitida** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 186, pl. 30, fig. 79. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Caryatis—Continued.

—— subtrigona Whiteaves. (1884.)

Geol. and Nat. Hist., Sur. Can.: Mes. Foss, vol. 1, pt. 3, p. 226. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bear Skin bay, Skidegate inlet; south side of Alliford bay, Queen Charlotte islands.

——? veta n. s. Whitfield. (1884.)

Mon. U. S. Geol. Sur., vol. 9, pp. 218, 219, pl. 28, figs. 16–19. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Farmingdale, Squankum, New Egypt, and at Shark river, New Jersey.

Caryophyllia (Lam.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton

—— egeria n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 275, pl. 6, figs. *7a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: [Cimarron, N. Mex.]

—— egeria White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 205. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colorado.

—— johannis n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 274, 275, pl. 6, figs. *6a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Cimarron, N. Mex.

—— sp. undet. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.
Formation: [Cretaceous.]
Location: Gloucester county, New Jersey.

Cassianella (Beyrich) Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 14. Phila., 1870. Wm. M. Gabb.

—— lingulata n. s. Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 14–15, pl. 5, figs. 13–13*a*, *b*. Phila., 1870. Wm. M. Gabb.
Formation: Triassic.
Location: Star cañon, Nevada.

Cassidulus (Lam.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 76. Phila., 1834. S. G. Morton.

—— abruptus n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 291. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Mississippi.

—— æquoreus n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 76, pl. 3, fig. 14. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Alabama.

Cassidulus—Continued.

—— æquoreus (Morton) D'Orb.

Paleont. Française Echinoides Irreguliers, Terr. Crét. t. 6, pp. 329, 330, pl. 926, figs. 6–12. Paris, 1853–1860. A. d'Orbigny.
Formation: Cretaceous.
Location: Prairie Bluff, Alabama.

—— æquoreus (Morton) Desor. (1858).

Synop. Echinides Foss., p. 290. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Prairie bluff, Alabama.

—— æquoreous (Morton) Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Alabama.

—— florealis (Morton) Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: New Jersey.

—— micrococcus n. s. Gabb. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 519. Phila., 1861. Wm. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— micrococcus (Gabb) Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Alabama.

—— porrectus n. s. Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Mississippi.

—— stantoni n. s. Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Colorado.

—— subconicus n. s. Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10. No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Mississippi.

—— subquadratus n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 291, pl. 47, fig. 19. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Mississippi.

—— subquadratus (Conrad) Clark. (1891.)

Johns Hopkins Univ. Cir. vol. 10 No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Mississippi.

Cassiope (Coquand) White. (1874.)

Prelim. Rep. Invert. Foss.; Geogr. and Geol. Expl. and Sur. West of 100th Meridian, p. 27. Wash., 1874. C. A. White.

pe—Continued.

hitfieldi n. s. White. (1874.)
im. Rep. Geogr. and Geol. Expl. and Sur. West 100th Merid., G. M. Wheeler, p. 27. Wash., 74. C. A. White.
ation: Cretaceous.
tion: At the head of Le Verken creek, and o in Pace's cañon, Utah.

hitfieldi White. (1875.)
Geogr. and Geol. Expl. and Sur. West of 100th ridian, vol. 4, pt. 1, p. 196, pl. 18, fig. 1*a*. sh., 1875. C. A. White.
ation: Cretaceous.
tion: At the head of Le Verken creek, and o in Pace's cañon, Utah.

pella n. g. White. (1877.)
U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. . 606. Wash., 1877. C. A. White.

rricula n. s. White. (1877.)
U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. . 606. Wash., 1877. C. A. White.
ation: Cretaceous.
tion: Black Buttes, Wyo.

rricula White. (1879.)
nth Ann. Rep. U. S. Geol. and Geogr. Sur. r., p. 220. Wash., 1879. C. A. White.
ation: Cretaceous.
ion: Black Buttes station, Wyoming.

rricula White. (1883.)
Ann. Rep. U. S. Geol. Sur., p. 58, pl. 23, figs. 29. Wash., 1883. C. A. White.
ion: Black Buttes, Wyo.

rricula White. (1880.)
th Ann. Rep. U. S. Geol. and Geogr. Sur. r., pt. 1, p. 97, pl. 27, figs. 3*a*–*g*. Wash., 1883. . White.
ation: Cretaceous.
ion: Black Buttes station, Wyoming.

s (subgen. Brong.?) (Chenu.) . (1876.)
U. S. Geol. Sur. Terr., vol. 9, p. 39. Wash., . F. B. Meek.

gus (Agas.) Conrad. (1850.)
Acad. Nat. Sci., Phila., vol. 2, 2d ser., -1854, p. 39. Phila., 1850-1854. T. A. rad.

formis (Couper MSS.) Conrad.)
Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850- , p. 39, pl. 1, fig. 15. Phila., 1850-1854. T. onrad.
tion: Cretaceous.
on: Timber creek, New Jersey.

formis (Conrad) Clark. (1891.)
Hopkins Univ. Cir. vol. 10, No. 87, p. 76. imore, 1891. Wm. B. Clark.
tion : Cretaceous.
on : New Jersey.

sillus n. s. Clark. (1891.)
Hopkins Univ. Cir. vol. 10, No. 87, p. 76. imore, 1891. Wm. B. Clark.
tion : Cretaceous.
on : Monmouth County, New Jersey.

Cavaria pustulosa (Hag.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 220. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville, New Jersey.

Cavea (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 175. Phila., 1862, 1863. Gabb & Horn.

—— prisca n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 175, 176 [pl. 21], fig. 67. Phila., 1862, 1863. Gabb & Horn.
Formation: [Cretaceous?]
Location: Fort Belknap, Texas.

Cellepora [Fabr.] Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 400. Phila., 1858-1860. Wm. M. Gabb.

—— bilabiata n. s. G. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 366. Phila , 1861. Gabb & Horn.
Formation: Cretaceous.
Location: New Jersey.

—— bilabiata (G. & H.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 400, pl. 69, figs. 21-23. Phila., 1858-1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Timber creek, New Jersey.

—— carinata n. s. G. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 366. Phila., 1861. Gabb & Horn.
Formation: Cretaceous.
Location: New Jersey.

—— carinata (G. & H.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 400, pl. 69, figs. 24-26. Phila., 1858-1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Timber creek, New Jersey.

—— exserta n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 125 [pl. 19], fig. 6. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica Hill, New Jersey.

—— granulosa (Hag.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 219, 220. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Timber creek, New Jersey.

—— janewayi n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 126 [pl. 19], fig. 7. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Seven miles below Yazoo, Miss.
[This specimen was evidently not found in place, as the locality has yielded no other Cretaceous fossils and is nearly 75 miles SW. of the known Cretaceous area in the well-known Tertiary region.]

Cellepora—Continued.

—— **prolifica** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 124, 125. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, New Jersey.
(= Cellepora bilabiata G. & H.)

—— **pumila** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 126, 127 [pl. 19], fig. 8. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, New Jersey.

—— **pusilla** (Hag.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 219. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Near Brownville and Turtle Mill, N. J.

—— **tubulata** n. s. Lonsdale. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, p. 70, figs. *a–c*. London, 1845. William Lonsdale.
Formation: Cretaceous.
Location: Lewis creek (South Washington, North Carolina), and Timber creek, New Jersey.

—— **typica** n. s. G. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 366. Phila., 1861. Gabb & Horn.
Formation: Cretaceous.
Location: New Jersey.

—— **typica** (G. & H.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858–1860, p. 400, pl. 69, figs. 27–29. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

Celtites (?) **vancouverensis** n. s. Whiteaves. (1887.)
Geol. and Nat. Hist. Surv. Can., vol. 2, n. ser., 1886, App. I, pp. 110, 111 B. Montreal, 1887. J. F. Whiteaves.
Formation: Triassic.
Location: North entrance point of Houston Stewart channel, Queen Charlotte islands, at east end of channel; Crescent inlet, Moresby island, Q. C. I.; north shore of Kun-ga Island, Q. C. I.; Browning creek, Forward inlet, Quatsino sound, Vancouver island, and Forward inlet, near Observatory rock, Robson island, Forward inlet, east side of Winter harbour, Forward inlet, a mile and a half north of Log Point, Alexander harbour, Galiano island, north end of Vancouver island, and Hernandez island, Strait of Georgia.

Ceratia (H. & A. Adams) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 21. Wash., 1889. C. A. White.

—— **nexilia** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 21, pl. 3, figs. 13 and 14. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: [Near Pence's ranch, Butte county, Cal.]

Ceratites (De Haan) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 22. Phila., 1864. W. M. Gabb.

—— **americanus** n. s. Harper. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 126–128, figs. A and B, p. 127. Phila., 1857. L. Harper.
Formation: Cretaceous.
Location: Bed of Black Warrior river, near Erie, Greene county, Alabama.

—— **haidingerii** (Hauer) Gabb. (1864.)
Geol. Surv. Cal. Paleont., vol. 1, pp. 22, 23, pl. 5, figs. 8, 9; pl. 4, fig. 9. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Humboldt Mining region, Nevada.

—— **virginianus** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 307, pl. 48, figs. 27*a–c*. Phila., 1858–1860. Wm. M. Gabb.
Formation: Triassic?
Location: Bath county, Virginia.

—— **whitneyi** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 23, 24, pl. 4, figs. 11–13. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: [California.]

Cerastoderma (subgen. Poli) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 166. Wash. 1876. F. B. Meek.

Cercomya (Agassiz) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 178. Wash., 1885. R. P. Whitfield.

—— **peculiaris** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 178, pl. 23, figs. 24, 25. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Crosswicks, New Jersey.

Cerithidea (Swain.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 568. Wash., 1876. F. B. Meek.

—— ? **nebrascensis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, fig. 19. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— (**Pirenella**) **nebrascensis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., Part 1, p. 90. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the head of Little Missouri river.

—— (**Pirenella**)? **nebrascensis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 569, pl. 43, figs 9 *a*, *b*, *c* (bis). Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Head of Little Missouri.

Cerithiopsis (Forbes & Hanley) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 116. Phila., 1864. W. M. Gabb.

iopsis—Continued.

lternata n. s. Gabb. (1864.)
l. Sur. Cal. Paleont., vol. 1, p. 116, pl. 21, figs. 4, 114 *a*. Phila., 1864. W. M. Gabb.
uation: Cretaceous.
ation: Northeast of Martinez and Cochran's, st of Mount Diablo, Cal.

noreauensis (M. & H.) Meek.).)
U. S. Geol. Sur. Terr., vol. 9, pp. 335-337, 31, fig. 4, fig. 38, p. 336. Wash., 1876. F. B. eek.
nation: Cretaceous.
tion: Moreau river. [S. Dakota.]

ium [Brug.] N. & G. (1840.)
Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, 215, Bruxelles, 1840. Nyst & Galeotti.

. undt. Credner. (1870.)
ch. Deutsch. Geol. Ges., Band 22, p. 237. Ber-, 1870. H. Credner.
ation: Cretaceous.
tion: New Jersey.

stinense n. s. Roemer. (1888.)
nt. Abhandl. Band 4, Heft 4, pp. 16, Taf. I [XXXI], fig. 12. Berlin, 1888. F. mer.
ation: Cretaceous.
ion: Two miles above the mouth of Bar- s creek, near Austin, Texas.

squense n. s. Shumard. (1859.)
. Acad. Sci., St. Louis, vol. 1, 1856-1860, 596, 597. St. Louis, 1856-1860. B. F. Shu- rd.
ation: Cretaceous.
ion: Near Bosque creek, Bosque county, as.

stamentii (Galeotti) N. & G.)
Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, 215, 216, fig. 5. Bruxelles, 1840. Nyst & otti.
ation: Jurassic.
ion: Tehuacan, Mexico.

gulatum n. s. N. & G. (1840.)
Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, 216, 217, fig. 6. Bruxelles, 1840. Nyst & otti.
ation: Jurassic.
on: Tehuacan, Mexico.

ierianum var. **suciense** n. var. aves. (1879.)
Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 122, pl. 15, figs. 10, 10*a*. Montreal, 1879. J. F. teaves.
tion: Cretaceous.
on: Sucia islands, Protection island.

xicanum n. s. Gabb. (1869.)
Sur. Cal., Paleont., vol. 2, p. 263, pl. 35, fig. Phila., 1869. Wm. M. Gabb.
tion: Cretaceous.
on: Sierra de las Conchas, near Arivechi, ra, Mexico.

Cerithium—Continued.

—— **nebrascensis** n. s. M. & H (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 125. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Near head waters of Little Missouri.

—— **nodosus** n. s. Tuomey. (1854.)
Proc. Acad. Nat. Sci. Phila., vol. 7, p. 170. Phila, 1856. M. Tuomey.
Formation: Cretaceous.
Location: Alabama.

—— **obliterato-granosum** n. s. Roemer. (1888.)
Paleont. Abhandl. Band 4, Heft 4, p. 16, Taf. I [XXXI], fig. 11. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Texas.

—— **pillingi** n. s. White. (1885.)
Bull. U. S. Geol. Sur., No. 22, p. 13, pl. 5, figs. 3-6. Wash., 1885. C. A. White.
Formation: Cretaceous.
Location: Shore of Todos Santos bay, lower California.

—— **skidegatense** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 215, pl. 27, figs. 3, 3*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island, opposite Leading island.

—— **suturosum** n. s. N. & G. (1840.)
Bull. Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, p. 215, fig. 4. Bruxelles, 1840. Nyst & Galeotti.
Formation: Cretaceous.
Location: Tehuacan, Mexico.

—— **totium-sanctorum** n. s. White. (1885.)
Bull. U. S. Geol. Sur., No. 22, p. 13, pl. 5, figs. 12 and 13. Wash., 1885. C. A. White.
Formation: Cretaceous.
Location: Shore of Todos Santos bay, Lower California.

—— (?) sp. undet. Roemer. (1849.)
Texas, p. 414. Bonn., 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— (?) sp. undet. Roemer. (1852.)
Kreide. von Texas, p. 38. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— ? sp. undet. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 62, 63, pl. 9, fig. 5. Wash., 1889 C. A. White.
Formation: Cretaceous.
Location: Palace camp Washington.

Cerípora sessilis (Hag.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 220, Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville, N. J.

Chaetetes (Fischer) White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 2, p. 220. Wash., 1880. C. A. White.

—— ? ? **dimissus** n. s. White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 2, pp. 220, 221. Wash., 1880. C. A. White.

Formation: Cretaceous.

Location: Fossil creek, sixteen miles west of Greeley and six miles south of Fort Collins, Colorado.

—— ? ? **dimissus** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 7, pl. 12, fig. 14*a*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Fossil ridge, sixteen miles westward from Greeley, and six miles southward from Fort Collins, Colorado.

Chemnitzia (d'Orb.) Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333. Phila., 1855–1858. T. A. Conrad.

—— subgen. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 287. Phila., 1858–1860. T. A. Conrad.

—— **cerithiformis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 339–341, pl. 32, figs. 10*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau Trading post. [S. Dakota.]

—— **distans** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333, pl. 35, fig. 30. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— ? **gloriosa** n. s. Roemer. (1849.)

Texas, pp. 412, 413. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall near New Braunfels, Tex.

——(?) **gloriosa** Roemer. (1852.)

Kreide. von Texas, pp. 40, 41, Taf. 4, fig. 12. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— **interrupta** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333, pl. 35, fig. 15. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **meekana** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 299, pl. 48, fig. 1. Phila., 1858–1860. Wm. M. Gabb.

Formation: Cretaceous.

Location: Prairie bluff, Alabama.

Chemnitzia—Continued.

—— **occidentale** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 391, pl. 68, fig. 10. Phila., 1858–1860. Wm. M. Gabb.

Formation: Cretaceous.

Location: Near the Choctaw Mission, Indian Territory.

—— **planulata** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p, 182. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: California.

—— **spillmani** (Con. ?) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 115, pl. 19, fig 70. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Pence's ranch, north of Oroville, Butte county, California.

—— **texana** (Roem.) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 261. Phila., 1869. Wm. M. Gabb.

Formation: Cretaceous.

Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **zebra** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 260, 261, pl. 35, fig. 5. Phila., 1869. Wm. M. Gabb.

Formation: Cretaceous.

Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

Chlamys (Bolton) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 23–25. Wash., 1876. F. B. Meek.

—— **nebrascensis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 25, 26, pl. 16, figs. 6*a*–*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Yellowstone river, one hundred and fifty miles from its mouth.

—— **nebrascensis** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 31. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: East branch of the Poplar river, on the 49th parallel; Old Wives creek, township 10, range 11, west of 3d principal meridian, Canada.

Cibota (Browne) Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 328. Phila., 1855–1858. T. A. Conrad.

—— **lintea** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 328, pl. 34, fig. 11. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

a—Continued.

ıultiradiata n. s. Gabb. (1860.)
c. Acad. Nat. Sci., Phila., for 1860, p. 95, pl. 2, g. 1. Phila., 1861. Wm. M. Gabb.
mation: Cretaceous.
ation: Mullica Hill, New Jersey.

multiradiata (Gabb) Whitfield. 4.)
ı. U. S. Geol. Sur., vol. 9, p. 94, pl. 11, figs. , 22. Wash., 1885. R. P. Whitfield.
nation: Cretaceous.
ıtion: Mullica Hill, New Jersey.

besa n. s. Whitfield. (1885.)
ı. U. S. Geol. Sur., vol. 9, pp. 93, 94, pl. 11, ;s. 30, 31. Wash., 1885. R. P. Whitfield.
nation: Cretaceous.
ıtion: Burlington county, New Jersey.

ɔstellata (Mort.) Whitfield. (1884.)
. U. S. Geol. Sur., vol. 9, pp. 91, 92, pl. 11, s. 34–36. Wash., 1885. R. P. Whitfield.
nation: Cretaceous.
.tion: Freehold, New Jersey.

ıiopsis (Con.) Whitfield. (1884.)
. U. S. Geol. Sur., vol. 9, pp. 92, 93, pl. 11, s. 32, 33. Wash., 1885. R. P. Whitfield.
ıation: Cretaceous.
.tion: Near Burlington, New Jersey.

s (Swains.) Shum. (1859.)
s. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. ı. St. Louis. 1856–1860. B. F. Shumard.

miger (Morton) Clark. (1891.)
s Hopkins Univ. Cir., vol. 10, No. 87, p. 75. lto., 1891. Wm. B. Clark.
ıation: Cretaceous.
tion: New Jersey.

lavigera (Koen.) Credner. .)
h. Deutsch. Geol. Ges., Band 22, p. 218. rlin., 1870. H. Credner.
ıation: Cretaceous.
tion: New Jersey.

atretum n. s. Morton. (1833.)
Jour. Sci., 1st ser., vol. 23, p. 294. New ven, 1833. S. G. Morton.
ation: Cretaceous.
ion: New Jersey.

leottii n. s. Desor. (1858.)
ɔ. Echinides Foss., p. 10. Paris and Wiesle, 1858. E. Desor.
ation: Jurassic.
ion: Anahuac mountains, 12 leagues westthwest of Tehuacan, Mexico.

migranosus n. s. Shumard. (1859.)
. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. , 610. St. Louis, 1856–1860. B. F. Shumard.
ation: Cretaceous.
ion: Upper part of the Bluffs of Red river, ıar county, Texas, and ten miles above the uth of Kiamesha creek.

emigranosus (Shumard) White. .)
th Ann. Rep. U. S. Geol. and Geogr. Sur. r., pt. 1, p. 38, pl. 18, figs. 2*a*, *b*. Wash., 3. C. A. White.

Cidaris—Continued.

—— sceptrifera (Mant.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 218. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— texanus n. s. Clark. (1891.)
Johns Hopkins Univ. Cir., vol. 10, No. 87, p. 75. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: Texas.

—— walcotti n. s. Clark. (1891.)
Johns Hopkins Univ. Cir., vol. 10, No. 87, p. 75. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: New Jersey.

——? sp. undet. Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 123. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, New Jersey.

Cidarites (Lam.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 75. Phila., 1834. S. G. Morton.

—— armiger n. s. Morton. (1842.)
Jour. Acad. Nat. Sci., Phila., vol. 8., 1st ser., 1839–1842, p. 215, pl. 11, fig. 1. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— diatretum Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24, pl. 10, fig. 10. New Haven, 1833. S. G. Morton.
[Described in vol. 23 as Cidaris diatretum n. s.]

—— diatretum Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 75, pl. 10, fig. 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester, New Jersey.

—— glandiferus (Goldf.) N. & G. (1840.)
Bull. Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, p. 219, fig. 12. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehucan, Mexico.

—— propinquus (Munster) N. & G. (1840.)
Bull. Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, p. 218, fig. 10. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehuacan, Mexico.

—— pustulosus n. s. N. & G. (1840.)
Bull. Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, p. 219, fig. 11. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehuacan, Mexico.

—— splendens n. s. Morton. (1841.)
Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843, pp. 132, 133. Phila., 1843. S. G. Morton.
Formation: Cretaceous.
Location: Timber creek, in Gloucester county, New Jersey.

Cinulia (Gray) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 111. Phila., 1864. W. M. Gabb.

—— (Gray) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 283. Wash., 1876. F. B. Meek.

—— **concinna** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can., Paleont., vol. 1, pt. 1, p. 46. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Twelve miles east of White Mud river (or Frenchman's creek); elbow of South Saskatchewan; Old Wives' creek, township 10, range 11, west of 3d principal meridian: "Two creeks, on the Assiniboine," Canada.

—— **inflata** (?) (Gabb) Whiteaves. (1874.)
Geol. Sur. Canada; Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, 2¼ and 2½ miles up.

—— **mathewsonii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 111, pl. 19, fig. 65. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Bull's Head point, Martinez; Orestimba cañon, Stanislaus county, California.

—— **obliqua** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 111, pl. 19, fig. 64, 64*a–c*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan Springs, Martinez; Pence's ranch, above Oroville; Chico creek, Texas Flat, Placer county; Cottonwood creek, Siskiyou mountains, Siskiyou county, California.

—— **obliqua** (?) (Gabb) Whiteaves. (1874.)
Geol. Sur. Canada; Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island.

—— **obliqua** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 2, p. 131. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island; southwest side of Denman island; Nanaimo river, 2½ miles up, Vancouver island; Protection, Gabriola, and Salt Springs or Admiralty islands; also at the Sucia islands.

—— **obliqua** (Gabb) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 44. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia and Sheep Jack islands.

—— **pinguis** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 112, pl. 29, figs. 221, 221*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Bluffs a mile west of Martinez, Cal.

Cinulia—Continued.

—— **pusilla** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, pp. 217, 218, pl. 28, figs. 5, 5*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South island, in Skidegate inlet.

—— **rectilabrum** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 264, 265, pl. 35, figs. 10, 10*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Ariverhi, Mexico.

—— (**oligoptycha**) **concinna** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 284, pl. 31, figs. 6, bis, *a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, S. Dakota; Yellowstone river, Montana; on the Assiniboine river, British America.

—— **sp. undet.** Whiteaves. (1874.)
Geol. Sur. Canada, Rep. Prog. for 1873–1874, p. 264. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— **sp. undet.** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, p. 249. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

Cinuliopsis n. g. Whiteaves. (1879.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 2, p. 131. Montreal, 1879. J. F. Whiteaves.

—— **typica** n. s. Whiteaves. (1879.)
Geol. Surv. Can.; Mes. Foss., vol. 1, pt. 2, pp. 131. 132, pl. 16, figs. 7, 7*a*, *b*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

Cirrus (Sowerby) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 49. Phila., 1834. S. G. Morton.

—— **crotaloides** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 49, pl. 19, fig. 5. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Erie, Alabama.

Cirsotrema tenuisculptum n. s. Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 127, pl. 16, figs. 3, 3*a–c*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

Cladophyllia furcifera n. s. Roemer. (1888.)
Paleont. Abhandl. Band 4, Heft 4, pp. 8, 9, Taf. 1 [xxxi], figs. 4*a*, 4*b*. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Texas.

gella (Deshayes) Morton. (1834.)

op. Org. Rem. Cret. Gr. U. S., p. 69. Phila., 1834. . G. Morton.

rmata n. s. Morton. (1833.)

. Jour. Sci., 1st ser., vol. 24, pp. 129, 130, pl. 9, g. 11. New Haven, 1833. S. G. Morton.

mation: Cretaceous.

ation: New Jersey.

rmata Morton. (1834.)

op. Org. Rem. Cret. Gr. U. S., p, 69, pl. 9, fig. 11. hila., 1834. S. G. Morton.

mation: Cretaceous.

ation: Near Arneytown, New Jersey; Prairie luff, Alabama.

rmata (Mort.) Gabb. (1861.)

c. Acad. Nat. Sci., Phila., for 1861, p. 364. hila., 1862. Wm. M. Gabb.

mation: Cretaceous.

ation: New Jersey.

rmata (Mort.) Whitfield. (1885.)

. U. S. Geol. Sur., vol. 9, pp. 192, 193, pl. 25, . 24. Wash., 1885. R. P. Whitfield.

mation: Cretaceous.

ation: Walnford, Monmouth county, and near ew Egypt, New Jersey.

tula ? californica n. s. Conrad. .)

. Expl. and Sur. R. R. R. Mississippi river to cific ocean, Prelim. Geol. Rep. of W. P. ake, Pal., p. 11. Wash., 1855. T. A. Conrad.

nation : Eocene [Cretaceous].

tion : Cañada de las Uvas.

californica Conrad. (1856.)

Expl. and Sur. R. R. R. Mississippi river to cific ocean, vol. 5, app., p. 322, pl. 2, fig. 11. ash., 1856. T. A. Conrad.

nation : Eocene [Cretaceous].

tion : Cañada de las Uvas.

lithes (Piestochilus) scarughi (M. & H.) Meek. 1864.

k List Invert. Foss., N. Am. Cret. and Jur., ithson. Mis. Coll., vol. 7, No. 177, p. 37. ash. 1864. F. B. Meek.

nation : Cretaceous.

tion : Dakota.

ella (Sow.) Morton. (1830.)

Jour. Sci., 1st ser., vol. 18, p. 245. New ven, 1830. S. G. Morton.

. undet. Morton. (1830.)

Jour. Sci., 1st ser., vol. 18, p. 245. New ven, 1830. S. G. Morton.

nation : Ferruginous sand. [Cretaceous.]

tion : New Jersey.

olus n. g. Gabb. (1869.)

Sur. Cal., Paleont., vol 2, pp. 188, 189. ila., 1869. Wm. M. Gabb.

rdatus (M. & H.) Whiteaves. .)

Sur. Can.; Mes. Foss., vol. 1, pt. 2, pp. 157, , pl. 18, fig. 3, 3*a*, *b*. Montreal, 1879. J. F. iteaves.

ation : Cretaceous.

ion : Nanaimo river, Vancouver island, two l a quarter miles up.

Clisocolus—Continued.

—— cordatus (Whiteaves) White. 1889.

Bull. U. S. Geol. Sur., No. 51, pp. 41, 42, pl. 6, figs. 8, 9. Wash., 1889. C. A. White.

Formation : Cretaceous.

Location : Sucia and Sheep Jack islands.

—— dubius n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 189. Phila., 1869. Wm. M. Gabb.

Formation : Cretaceous.

—— dubius (Gabb) White. (1889.)

Bull U. S. Geol. Sur., No. 51, p. 41, pl. 6, figs. 5-7. Wash., 1889. C. A. White.

Formation : Cretaceous.

Location : Sucia island.

Closteriscus n. g. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 306, 307. Wash., 1876. F. B. Meek.

—— tenuilineatus (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 308, 309, pl. 19, figs. 10*a*, *b*, and fig. 9*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Cheyenne river [S. Dakota].

Clydonites (Hauer) Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 109. Wash., 1877. F. B. Meek.

—— lævidorsatus (Hauer) Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 109, 110, pl. 10, fig. 7. Wash., 1877. F. B. Meek.

Formation: Triassic.

Location: Buena Vista cañon, North Fork, Humboldt range, Nevada.

Clypeaster (Lam.) Morton. (1830).

Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.

—— florealis n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 294. New Haven, 1833. S. G. Morton.

Formation: Ferruginous sand. [Cretaceous.]

Location: Delaware.

—— florealis Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, pl. 10, fig. 12. New Haven, 1833. S. G. Morton.

—— florealis Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 76, pl. 3, fig. 12, pl. 10, fig. 12. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Delaware and Chesapeake canal.

—— geometricus n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 131, pl. 10, fig. 9. New Haven, 1833. S. G. Morton.

Formation: Cretaceous.

Location: Delaware and Chesapeake canal.

—— geometricus Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 76, pl. 10, fig. 9. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Canal excavations of Delaware.

Clypeaster—Continued.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Cœlosmilia americana n. s. Roemer. (1888.)
Paleont. Abhandl. Band 4, Heft 4, pp. 6, 7, Taf. 1 [xxxi], figs. *5a, b*. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Barton's creek, near Austin, Tex.

——? atlantica (Mort.) Bölsche. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 217. Berlin, 1870. Wilh. Bölsche.
Formation: Cretaceous.
Location: Brownville, N. J.

Columna (Perry) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 554, 555. Wash., 1876. F. B. Meek.

—— teres (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 555–556, pl. 44, figs. 11*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Fort Union, [N.] Dakota, on the upper Missouri.

—— teres (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 244. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyoming.

—— teres (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 88. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Mouth of Judith river, Montana.

—— teres (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 454, pl. 25, fig. 15. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— vermicula (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 556, 557, pl. 44, figs. 12*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Fort Union, on the upper Missouri.

—— vermicula (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 88. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Mouth of Judith river, Montana.

—— vermicula (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 454, pl. 25, fig. 16. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— vermicula var. contraria n. var. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 557. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Fort Union, on the upper Missouri.

Cominella (Gray) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 22. Wash., 1889. C. A. White.

—— lecontii n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 22, pl. 4, figs. 4 and 5. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Pence's ranch, Butte county, California.

Complanaria (subgen. Swainson) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 113. Wash., 1876. F. B. Meek.

—— cretacea n. s. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog., for 1873–74, pp. 264, 266, 267, pl. fig. 2. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Below Dodd Narrows.

—— cretacea Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 156, 157. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Below Dodd Narrows, Vancouver island.

Conus [Linn.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 49. Phila., 1834. S. G. Morton.

—— canalis n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci. Phila., vol. 3, 2d ser., 1855–1858, p. 331, pl. 35, fig. 22. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— gyratus n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24, p. 131, pl. 10, fig. 3. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Southern states.

—— gyratus Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 49, pl. 10, fig. 13. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina.

—— hornii n. s. Gabb. (1864.)
Geol. Sur. Cal., Palaeont., vol. 1, pp. 122, 123, pl. 29, fig. 226. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon, California.

—— remondii (Con.) Gabb. (1864.)
Geol. Sur. Cal., Palaeont., vol. 1, p. 122, pl. 20, fig. 79. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cochran's, east of Mount Diablo, and Bull's Head point, northeast of Martinez; Clayton; San Diego; near Cañada, Los Angeles county, California.

—— sinuatus n. s. Gabb. (1864.)
Geol. Sur. Cal., Palaeont., vol. 1, p. 123, pl. 29, fig. 227. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

lliochama n. g. White. (1885.)
ill. U. S. Geol. Sur., No. 22, pp. 9, 10. Wash., 1885. C. A. White.

orcutti n. s. White. (1885.)
ill. U. S. Geol. Sur., No. 22, pp. 10–12, pls. 1–l. Wash., 1885. C. A. White.
rmation: Cretaceous.
cation: Shore of Todos Santos bay, Lower Cali-ornia, and near the town of Wallala, Mendo-ino county, California.

icula (Megerle) Prime. (1865.)
n. Am. Corbiculadæ (Recent and Fossil), Smith-on. Misc. Coll. vol. 7, No. 145, pp. 2, 3. Wash., 865. T. Prime.

(Mühlfeldt) Meek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, p. 161. Wash., 876. F. B. Meek.

equilateralis n. s. Meek. (1873.)
th Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 495. Wash., 1873. F. B. Meek.
rmation: Cretaceous.
ation: Bear River city (Sulphur creek), Wy-ming.

nnosa (Con.) Whitfield. (1885.)
n. U. S. Geol. Sur., vol. 9, pp. 26, 27, pl. , figs. 2–4. Wash., 1885. R. P. Whitfield.
rmation: Cretaceous.
ation: Near Washington, Middlesex county, ew Jersey; Sayre and Fisher's brick and clay ards, near Sayreville, New Jersey; near Wood-ridge, N. J.

augheyi n. s. White. (1882.)
c. U. S. Nat. Mus., vol. 5, p. 95, pl. 4, figs. 4–6. Vash, 1883. C. A. White.
mation: Cretaceous.
ation: Valley of South Platte river, north-astern Colorado.

ugheyi White. (1883.)
rd Ann. Rep. U. S. Geol. Sur., p. 438, pl. 21, gs. 4–6. Wash., 1883. C. A. White.
mation: Cretaceous.
ation: Valley of the South Platte river, in orthern Colorado, east of the Rocky moun-ins.

erthoudi n. s. White. (1882.)
c. U. S. Nat. Mus., vol. 5, pp. 94, 95, pl. 4, figs. -3. Wash., 1883. C. A. White.
mation: Cretaceous.
ation: Valley of South Platte river, north-stern Colorado.

erthoudi White. (1883.)
rd Ann. Rep. U. S. Geol. Sur., p. 438, pl. 21, figs. -3. Wash., 1883. C. A. White.
mation: Cretaceous.
ation: East of the Rocky mountains in Colo-do.

ardiniæformis n. s. White. (1878.)
l. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. pp. 911–912. Wash., 1878. C. A. White.
mation: Cretaceous.
tion: Valley of Crow creek, fifteen miles above confluence with Platte river, northern Col-ado.

Corbicula—Continued.

—— **cardiniæformis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 169. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colorado.

—— **cardiniæformis** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 73, pl. 25, figs. 5*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, fifteen miles above the confluence of that creek with Platte river, northern Colorado.

—— **cleburni** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3. p. 711. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Crow creek, Colorado, about twelve miles north of its confluence with South Platte river.

—— **cleburni** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 168, 169. Wash., 1979. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colorado.

—— **cleburni** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 73, 74, pl. 23, figs. 1*a*–*c*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colorado, about fifteen miles above the confluence of that creek with Platte river.

—— **cleburni** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 20, figs. 7–9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of the South Platte, Colorado.

—— ? **crassatelliformis** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 315, 316. Wash., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Hallville coal mines [Wyoming].

—— **cytheriformis** (M. & H.) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, p. 9. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Near the mouth of the Judith river, Nebraska [Montana].

—— **cytheriformis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 520, 521, pl. 40, figs. 5*a*–*e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Bad Lands of Judith river, on the upper Missouri, in Montana; mouth of Muscle-shell river; from near Fort Benton, and from one hundred and twenty-five miles below the same.

Corbicula—Continued.

—— **cytheriformis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 212. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colorado.

—— **cytheriformis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bitter creek valley, two miles west of Point of Rocks station, Wyoming.

—— **cytheriformis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 219. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyoming.

—— **cytheriformis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 74, pl. 21, figs. *4a–d.* Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: About two miles west of Point of Rocks station, Wyoming.

—— **cytheriformis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 22, figs. 1–6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **cytheriformis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 7. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rye-grass flat, Old Man river, Canada.

—— **? emacerata** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 26, pl. 2, figs. 5 and 6. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Clay banks near Woodbridge, N. J.

—— **? fracta** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 314, 315. Wash., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Hallville coal mines [Wyoming].

—— **? fracta var. crassiuscula** n. var. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 512, 513. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Black Buttes, Wyo.

—— **moreauensis** (M. & H.) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, pp. 7, 8. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Near Moreau river, Nebraska [S. Dakota].

Corbicula—Continued.

—— **nebrascensis** (M. & H.) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson Misc. Coll., vol. 7, No. 145, p. 8. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Near Moreau river, Nebraska [S. Dakota]

—— **nebrascensis** (M. & H.) Meek (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 522, pl. 43, figs. *2a, b.* Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau River, [S.] Dakota.

—— **nebrascensis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, p. 74. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **nebrascensis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 20, figs. 12, 13. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **? nucalis** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 304, 305. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

—— **nucalis** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 163, 164, pl. 2, figs. *5a–c.* Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kansas.

—— **obesa** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 712, 713. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, Colorado, fifteen miles north of its confluence with South Platte river.

—— **obesa** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 169. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colorado.

—— **obesa** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Bijou creek, Colorado.

—— **obesa** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, pp. 72, 73, pl. 23, figs. *3a–e.* Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valleys of Crow and Bijou creeks, northern Colorado.

Corbicula—Continued.

—— obesa White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 23, figs. 7-11. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of the South Platte and its tributaries, Colorado.

—— obliqua n. s. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 8, 9, pl. 1, figs. 4, 4*a*, *b*, Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Rye-grass flat, Old Man river, Bow river, eight miles west of Blackfoot crossing; Upper Belly river, twenty-two miles above the mouth of the Waterton, and Little Bow river, opposite the mouth of Snake valley, Canada.

—— occidentalis (M. & H.) Prime. (1865.)

Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, pp. 8, 9. Wash., 1865. T. Prime.

Formation: Tertiary [Cretaceous].

Location: Bad lands of the Judith river, Nebraska [Montana].

—— occidentalis (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 521, 522, pl. 40, figs. 6*a*–*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Bad lands of the Judith river, Montana, on the Upper Missouri.

—— occidentalis (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 208, 209. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Yampa valley, near Cañon park, Colorado.

—— occidentalis (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 216. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Point of Rocks station, Wyoming.

—— occidentalis (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 219. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Black Buttes station, Wyoming.

—— occidentalis (M. & H.) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 75, pl. 21, figs. 3*a*–*c*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valleys of Bitter creek and Yampa river.

—— occidentalis (M. & H.) White. (1883.)

Third. Ann. Rep. U. S. Geol. Sur., p. 437, pl. 17, figs. 6, 7, pl. 23, figs. 1-6. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

Corbicula—Continued.

—— occidentalis (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 7-8, pl. 1, figs. 3, 3 *a*. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: St. Mary river, two miles north of the 49th parallel, and four miles west of the St. Mary river; Bow river, mouth of East Arrow-wood creek; Rye-Grass flat, Old Man river; upper Belly river, twenty-two and twenty-three miles above the mouth of the Waterton; Oyster creek; northwest branch of the north fork of the Old Man river; Red Deer river, near the 8th correction line, and forks of the Devil's Pine and Three Hills creeks, Canada.

—— occidentalis (M. & H.) Whiteaves (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 40. Montreal 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Milk river ridge, Canada.

—— occidentalis (M. & H.) Whiteaves (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 67, 68. Montreal 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: North side of the Milk river, five miles below Pa-Kow-Ki coulée, Canada.

—— pugetensis n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 60, pl. 11, fig. 8. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Carbonado, Washington.

—— subelliptica (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 20, figs. 10-11. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— ? subtrigonalis n. s. Meek. (1871.)

Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 305-306. Wash., 1871. F. B. Meek.

Formation: Cretaceous.

Location: Twelve miles southwest of Salina, Kans.

—— ? subtrigonalis Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 164, 165, pl. 2, fig. 6. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Twelve miles southwest of Salina, Kans.

—— umbonella (Meek) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 438, pl. 21, figs. 7-10. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: East of the Rocky mountains in Colorado.

—— willisi n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 59, pl. 11, figs. 3-7. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Carbonado, Wilkeson (Fletts creek), and valley of Green river, Washington.

Corbicula—Continued.

—— **? (Astarte?) pikensis** n. s. Hill. (1888.)

Ann. Rep. Geol. Sur. Arkansas, for 1888, vol. 2, p. 134, pl. 2, figs. 13, 13*a*, 14–17. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous.
Location: Throughout the Trinity beds in Arkansas.

—— **[Cyrena?] securis** n. s. Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 494, 495. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Bear River city (Sulphur creek), Wyoming.

—— **(Leptesthes) cardiniæformis** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 22, figs. 10–15. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: East of the Rocky mountains in Colorado.

—— **(Leptesthes) fracta** (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 169. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colorado.

—— **(Leptesthes) fracta** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 209. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley, near Cañon park, Colorado.

—— **(Leptesthes) fracta** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 212, 213. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colorado.

—— **(Leptesthes) fracta** (Meek) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 75–77, pl. 23, figs. 2*a–e*, pl. 21, fig. 5*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Hallville, [Wyoming].

—— **(Leptesthes) fracta** (Meek.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 439, pl. 20, figs. 1–6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, Wyoming.

—— **(Leptesthes) macropistha** n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 713. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Crow creek, northern Colorado, 15 miles above its confluence with the South Platte river.

Corbicula—Continued.

—— **(Leptesthes) macropistha** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 169. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colorado.

—— **(Leptesthes) macropistha** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Bijou creek, Colorado.

—— **(Leptesthes) macropistha** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 78, 79, pl. 23, figs. 4*a–f*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valleys of Crow and Bijou creeks, northern Colorado.

—— **(Leptesthes) macropistha** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 21, figs. 11–14. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: East of the Rocky mountains in Colorado.

—— **? (Leptesthes) planumbona** n. s. Meek. (1875.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 1, No. 1, 2d ser., pp. 43–45. Wash., 1875. F. B. Meek.
Formation: [Cretaceous.]
Location: Two hundred miles east of Denver, Colo.

—— **(Leptesthes) planumbona** (Meek.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Bijou creek, Colorado.

—— **(Leptesthes) planumbona** (Meek.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 169, 170. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colorado.

—— **(Leptesthes) planumbona** (Meek.) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 77, 78, pl. 21, figs. 2*a–d*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Two hundred miles east of Denver city, on the Kansas Pacific railroad; valleys of Crow and Bijou creeks, northern Colorado.

—— **(Leptesthes) planumbona** (Meek) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 22, figs. 7–9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: East of the Rocky mountains in Colorado.

Corbicula—Continued.

—— (Leptesthes) subelliptica (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 523, 524, pl. 43, figs. 9*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On Cherry creek, [S.] Dakota; and on Bijou creek, Colorado.

—— (Leptesthes) subelliptica (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 169. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colorado.

—— (Leptesthes) subelliptica (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Bijou creek, Colorado.

—— (Leptesthes) subelliptica (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 79. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri River region; valley of Bijou creek, northern Colorado.

—— (Leptesthes) subelliptica (var. moreauensis n. var.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 524, pl. 43, figs. 1*a–b*, 2*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location; Moreau river, [S.] Dakota.

—— (Veloritina) bannisteri n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 513. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Black Butte station, Wyoming.

—— (Veloritina) cytheriformis (M. & H. ?) Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 511. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Point of Rocks, on Bitter creek, Wyoming.

—— Veloritina (durkeei) Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 167–170, pl. 16, figs. 6*a–g*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: On Sulphur creek, near Bear river, Wyoming.

—— (Veloritina) durkeei (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

Corbicula—Continued.

—— (Veloritina) durkeei (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 79–80. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, near the mouth of Sulphur creek.

—— (Veloritina) durkeei (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 437, pl. 8, figs. 8–11. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— (Veloritina) inflexa n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 493, 494. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Near Missouri river, below Gallatin city, Mont.

—— sp. undet. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 212. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colorado.

Corbis ? sp. undet. Roemer. (1849.)
Texas, p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Texas, p. 47. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

Corbula (Brug.) Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 150. Wash., 1857. T. A. Conrad.

—— alæformis n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 177, pl. 29, fig. 63. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Near Lower Lake village, Lake county, California.

—— bisulcata n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 11, pl. 2, figs. 13, 14. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— blakei n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 29, pl. 5, fig. 24 Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Humboldt mining region.

—— carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 11, pl. 2, fig. 15. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

Corbula—Continued.

—— **caudata** n. s. Tuomey. (1854.)

Proc. Acad. Nat. Sci., Phila., vol. 7, p. 170. Phila., 1856. M. Tuomey.
Formation: Cretaceous.
Location: Noxubie [Mississippi].

—— **concinna** n. s. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 219, 220, pl. 29, figs. 3, 3a. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay, Skidegate inlet; Bear Skin bay.

—— **crassatelliformis** (Meek) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 80. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Crow creek, Colorado, east of the Rocky mountains.

—— **crassimarginata** (M. & H.) Meek. (1876.).

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 244, 245, pl. 17, figs. 14a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, [S.] Dakota.

—— **crassiplica** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 394, pl. 68, fig. 25. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Cut on the Memphis and Charleston Railroad where it crosses the Tennessee and Mississippi state line.

—— **crassiplica** (Gabb) Whitfield. (1884).

Mon. U. S. Geol. Sur., vol. 9, pp. 178, 179, pl. 23, fig. 30. Wash., 1885. R. P. Whitfield.
Formation; Cretaceous.
Location: Haddonfield, N. J.

—— **cultriformis** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 149, pl. 22, fig. 122. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: West of Martinez, California.

—— **dubiosa** n. s. White, (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 236. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **dubiosa** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 249. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— **dubiosa** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 250. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyoming.

—— **elegans** (Sow.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 133, 134. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

Corbula—Continued.

—— **engelmanni** Meek. (1876.)

Rep. Expl. Great Basin Terr., Utah, p. 362, pl. 5, figs. 13a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Bear river, near the mouth of Sulphur creek.

—— **englemanni** (Meek) White. (1879).

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— **eufaulensis** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 283. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Alabama.

—— **foulkei** n. s. Lea. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 149. Phila., 1862. Isaac Lea.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **foulkei** (Lea) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 180, pl. 23, figs. 27–29. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— ? **gregaria** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 84. Phila., 1856. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, 150 miles from mouth, Nebraska [Montana].

—— **graysonensis** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 608. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Post-oak creek, near Sherman, Grayson county, Texas.

—— **hornii** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 149, 150, pl. 29, fig. 238. Phila, 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

—— **hornii** Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p, 176, pl. 28, figs. 62a, b. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.

—— **inornata** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 52. Phila., 1859. Meek & Hayden.
Formation; Cretaceous.
Location: Long lake.

—— **inornata** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 245, 246, pl. 30, figs. 4a–d. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Long lake, near Fort Pierre, [S.] Dak.

—— **mactriformis** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 117. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Clark [N. Dakota].

Corbula—Continued.

—— **mactriformis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 80. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Fort Clark, in the Upper Missouri River region.

—— **mactriformis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 442, pl. 18, figs. 12–15. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri River region.

—— **mactriformis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can., Paleont., vol. 1, pt. 1, p. 27. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Wood End depot, Souris river, Canada.

—— **moreauensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 83, 84. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebraska [S. Dakota].

—— **minima** (d'Orb.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 13, pl. 17, figs. 4, 4a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island.

—— **nematophora** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 496, 497. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Near Cedar city, southern Utah.

—— **nematophora** (Meek) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of 100th meridian, vol. 4, pt. 1, pp. 188, 189, pl. 17, figs. 7*a–c*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Plateau near the west crossing of the north fork of Virgin river, and elsewhere near the north fork of that river, Utah.

—— **nematophora** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 236. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **nematophora** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 290, 291, pl. 3, figs 4*a–d*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Cedar City, southern Utah.

—— **occidentalis** n. s. Conrad. (1854.)
Rep. U. S. and Mex., Bound. Sur., vol. 1, pt. 2, p. 150, pl. 6, fig. 9. Wash., 1857. T. A. Conrad.
Formation: Eocene? [Cretaceous].
Location: Western Texas.

Corbula—Continued.

—— **oxynema** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr, App. A., p. 11. T. A. Conrad.
Formation: Cretaceous.
Location: Cape Fear river, North Carolina.

—— **parilis** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 150, pl. 29, figs. 239, 239*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez to Marsh's, east of Mount Diablo and San Diego, Cal.

—— **perangulata** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can., Paleont., vol. 1, pt. 1, pp. 9–11, pl. 1, figs. 5, 5*a*, *b*, pl. 2, fig. 1. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rye-Grass flat, Old Man river; upper Belly river, twenty-three miles above the mouth of the Waterton, and Scabby butte, seven miles north of the confluence of the Belly and Old Man rivers, Canada.

—— **perbrevis** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr, App. A, p. 11, pl. 2, fig. 5. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— **perundata** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 116. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Mouth of the Judith [Montana].

—— **perundata** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 80. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **perundata** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 9. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South or first branch of the Milk river, N. W. T., Canada.

—— **perundata** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 62. Montreal, 1885. J. F. Whiteaves
Formation: Cretaceous.
Location: Peigan creek, township 7, range 6 west of 4th principal meridian, near U. S. boundary line, on a branch of the east fork of the Milk river, Canada.

—— **perundata** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 69. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Creek "about fourteen miles northeastward from the most eastern of the Three buttes," Canada.

Corbula—Continued.

—— **perundata?** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 80. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky Spring ridge, near MacLeod, Benton trail, Canada.

—— ? **primorsa** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 148, pl. 22, figs. 120, 120a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous?
Location: South side of Corral hollow, Alameda county, California.

—— **pyriformis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— **pyriformis** (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 82. Wash. 1883. C. A. White.
Formatian: Cretaceous.
Location: Peculiar to the Bear River Laramie series, and at most of the known localities at which those strata are exposed.

— **pyriformis** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. and Geogr. Sur., p. 441. pl. 8, figs. 12–16. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and the adjacent parts of Utah.

—— **striatula** (Sow.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 236. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Woodbury, N. J.

— **subcompressa** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 394, pl. 68, fig. 24. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Two miles east of Middleton, Hardeman county, Tennessee.

—— **subcompressa** (Gabb) Whitfield (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 180, 181, pl. 23, fig. 26. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **subgibbosa** n. s. Conrad. (1875.)
Rep. Geol. Surv. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 11, pl. 2, fig. 12. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

——**subtrigonalis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila.. vol. 8, for 1856, p. 116. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Mouth of the Judith [Montana].

Corbula—Continued.

—— **subtrigonalis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 170. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colorado.

—— **subtrigonalis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Bijou creek, Colorado.

—— **subtrigonalis** (M. & H.) White (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 209. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley near Cañon park, Colorado.

—— **subtrigonalis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bitter Creek valley, two miles west of Point of Rocks station, Wyoming.

—— **subtrigonalis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 220. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyoming.

—— **subtrigonalis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 80. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **subtrigonalis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Survey, p. 442, pl. 19, figs. 10–17. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **subtrigonalis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur., Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 62. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Peigan creek, township 7, range 6, west of 4th principal meridian, Canada.

—— **subtrigonalis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur., Can., Cont., Can., Paleont., vol. 1, pt. 1, p. 68. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river east of Driftwood bend, and Belly river near its junction with the Bow

Corbula—Continued.

river; South Saskatchewan, six miles below the mouth of Bow river; north side of Milk river, five miles below Pa-kow-ki Coulée, and south side of Milk river, one mile above the mouth of Pa-kow-ki Coulée; south side of Saskatchewan; one mile below the mouth of the Bow river, Canada.

—— **subundifera** n. s. White. (1876.)
Rep. Geol. Uinta Mts, p. 129. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous.]
Location: Point of Rocks, Wyoming.

—— **subundifera** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 216. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Point of Rocks station, Wyoming.

—— **traskii** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 149, pl. 22, figs. 121, 121*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas Flat, Placer county; Tuscan Springs, Tehama county; Pence's Ranch, Butte county, California.

—— **traskii** (?) (Gabb) Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 138, pl. 17, fig. 3. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island.

—— **tropidophora** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geog. Sur. Terr., pp. 514, 515. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Point of Rocks, Wyoming.

—— **tropidophora** (Meek) White. (1880.)
Twelfth Ann. Rep. U.S. Geol. and Geog. Sur. Terr., pt. 1, p. 80. Wash., 1883. C. A. White.
Formaation: Cretaceous.
Location: Crow creek, Colorado, east of the Rocky mountains.

—— **tuomeyi** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 604. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Grayson county, four and a half miles north of Sherman, Tex.

—— **undifera** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geog. Sur. Terr., pp. 513, 514. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Rock Springs station, Wyoming.

—— **undifera** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geog. Sur. Terr., p. 213. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth Hills, Colorado.

Corbula—Continued.

—— **undifera** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geog. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Rock Springs, Wyoming.

—— **undifera** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geog. Sur. Terr., p. 219. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyoming.

—— **undifera** (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geog. Sur. Terr., pt. 1, pp. 80, 81, pl. 29, figs. 4*a–f*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Rock Springs station, Wyoming.

—— **undifera** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 442, pl. 18, figs. 6–9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Bitter creek, southern Wyoming, and Yampa river, northwestern Colorado.

—— **undifera** var. **subundifera** n. var. White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt 1, pp. 81, 82, pl. 29, figs. 5*a–c*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Point of Rocks station, Wyoming.

—— **undifera** var. **subundifera** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 442, pl. 18, figs. 10, 11. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Bitter creek, southern Wyoming.

—— **ventricosa** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 83. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebraska [S. Dakata].

—— (**Anisorhynchus** ?) **engelmanni** Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 174, 175, pl. 17, fig. 1, 1*a*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Bear river, mouth of Sulphur creek, Wyoming.

—— (**Anisorhynchus**) **pyriformis** Meek. (1876.)
Rep. Expl. Great Basin, Terr. Utah, pp. 361, 362, pl. 5, figs. 9, 10. Wash., 1876. F. B. Meek.
Formation: Cretaceous ?
Location: Bear river, near the mouth of Sulphur creek.

—— (**Anisorhynchus**) **pyriformis** Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 170–174, pl. 17, figs. 2*a–d*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Sulphur creek, near Bear river, Wyoming.

Corbula—Continued.

—— (Azara) engelmanni n. s. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 431. Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Limestone hill, Bear river [Wyoming].

—— (Azara) pyriformis n. s. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 431. Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Limestone hill, Bear river.

—— (Azara) pyriformis var. concentrica n. var. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 431. Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Limestone hill, Bear river.

—— (Pachyodon) mactriformis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 528, 529, pl. 43, figs. *7a–f.* Wash., 1876. F. B. Meek.
Formation: Lower Eocene ? [Cretaceous].
Location. Fort Clark, [N.] Dakota, on the Upper Missouri.

—— (Pachyodon) perundata (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 530, 531, pl. 40, figs. *4a–d.* Wash., 1876. F. B. Meek.
Formation: Cretaceous ?
Location: Mouth of Judith river, Montana.

—— (Pachyodon) subtrigonalis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 529, 530, pl. 40, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Mouth of Judith river, Montana.

—— (Potamomya ?) concentrica n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 313. Phila., 1861. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Bear river, lat. 40° 12′ north, long. 110° 52′ west.

—— (Potamomya ?) engelmanni n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 313. Phila., 1861. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Bear river, lat. 40° 12′ north, long. 110° 52′ west.

—— (Potamomya ?) pyriformis n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 312, 313. Phila., 1861. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Bear river, lat. 40° 12′ north, long. 110° 52′ west.

Corbula—Continued.

—— n. s. Hill. (1889.)
Geol. Sur., Texas, Bull. No. 4, p. 16. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Gillespie county, Texas.

—— sp. undet. Owen. (1860.)
Second Rep. Geol. Rec., Arkansas, pl. 8, fig. 1. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— sp. undet. Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 150, 151, pl. 14, fig. 2. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

Corbulamella n. g. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, pp. 142, 143. Phila., 1858. Meek & Hayden.

—— gregaria M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 143. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Yellowstone river, Nebraska [Montana].

—— gregaria (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 247, pl. 17, figs. 13*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location. On the Yellowstone river, Montana.

—— gregaria (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 80. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: West flank of West Butte, Montana, in the Sweet Grass hills, near the international boundary line.

Cordiera (Rouault). Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 93. Phila., 1864. W. M. Gabb.

—— microptygma n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 93, 94, pl. 23, fig. 203. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, California.

—— mitræformis n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 153, 154, pl. 26, fig. 32. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Colusa county, near the Hot Sulphur springs, California.

Corimya (Agassiz) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 170. Wash., 1885. R. P. Whitfield.

—— tenuis n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 170, 171, pl. 23, figs. 9–11. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Upper Freehold and Marshallville, N. J.

oceras n. g. Hyatt. (1877.)

ep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 107, 108. Wash., 1877. Alpheus Hyatt.

ssatella [Lam.] Morton. (1834.)

ynop. Org. Rem. Cret. Gr. U. S., p. 66. Phila., 1834. S. G. Morton.

(Lam.). Meek. (1876.)

ep. U. S. Geol. Sur. Terr., vol. 9, p. 116. Wash., 1876. F. B. Meek.

alta Conrad. (1855.)

ep. Expl. and Sur. R. R. R. Mississippi river to Pacific Ocean, App. Prelim. Geol. Rep. of W. P. Blake, Pal., p. 9. Wash., 1855. T. A. Conrad.

ormation: Eocene [Cretaceous].

ocation: Cañada de las Uvas.

alta Conrad. (1856.)

ep. Expl. and Sur. R. R. R. Mississippi river to Pacific ocean, vol. 5, App., p. 321. Wash., 1856. T. A. Conrad.

ormation: Eocene [Cretaceous].

ocation: Cañada de las Uvas.

cimarronensis n. s. White. (1879.)

leventh Ann. Rep. U. S. Geol. and Geogr. Sur. Ter., pp. 287, 288, pl. 5, figs. 3a–c. Wash., 1879. C. A. White.

ormation: Cretaceous.

ocation: Cimarron, N. Mex.

compacta n. s. Gabb. (1869.)

eol. Sur. Cal., Paleont., vol. 2, p. 190, pl. 30, fig. 85. Phila., 1869. W. M. Gabb.

ormation: Cretaceous.

ocation: Martinez, Cal.

conradi n. s. Whitfield. (1885.)

on. U. S. Geol. Sur., vol. 9, pp. 209, 210, pl. 28, figs. 1–5. Wash., 1885. R. P. Whitfield.

ormation: Cretaceous.

ocation: Shark river, near New Egypt, and at Squankum, N. J.

cuneata (Gabb) Whitfield. (1885.)

on. U. S. Geol. Sur., vol. 9, pp. 118, 119, pl. 17, figs. 18–20. Wash., 1885. R. P. Whitfield.

ormation: Cretaceous.

ocation: Monmouth, N. J.

delawarensis n. s. Gabb. (1860.)

our. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 303, pl. 48, fig. 21 [20]. Phila., 1858–1860. Wm. M. Gabb.

ormation: Cretaceous.

ocation: Deep cut, Delaware and Chesapeake canal.

delawarensis (Gabb) Whitfield. 385.)

on. U. S. Geol. Sur., vol. 9, p. 119. Wash., 1885. R. P. Whitfield.

ormation: Cretaceous.

delawarensis (Gabb) Whitfield. 385.)

on. U. S. Geol. Sur., vol. 9, pp. 210, 211, pl. 27, figs. 14, 15 Wash., 1885. R. P. Whitfield.

ormation: Cretaceous.

ocation: Mostly from the pits of John Irons, New Egypt, and other places near by, and also from Poke hill, New Jersey.

Crassatella—Continued.

—— eufalensis n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 394, pl. 68, fig. 26. Phila., 1858–1860. Wm. M. Gabb.

Formation: Cretaceous.

Location: Eufaula, Alabama.

—— evansii n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 383, 384, pl. 1, figs. 9a–e. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: Sage creek.

—— ? exigua n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, p. 179, Taf. 16, figs. 30, 31. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaska.

—— grandis n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 181, pl. 24, fig. 163. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Near Clayton; Alizos creek, near Cañada de las Uvas, California.

—— grandis Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 189. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

—— ligeriensis (d'Orb.) Conrad. (1872.)

Proc. Acad. Nat. Sci., Phila., for 1872, p. 50, [pl. 1], fig. 10. Phila., 1872. T. A. Conrad.

Formation: Cretaceous.

—— lineata n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861–1862, p. 201. Boston, 1862. B. F. Shumard.

Formation: Cretaceous.

Location: Near Corsicana, Navarro county, Texas.

—— lintea n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 279, pl. 46, fig. 5. Phila., 1858–1860. T. A. Conrad.

Formation: Cretaceous.

Location: Alabama.

—— littoralis n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 41, pl. 1, fig. 3. Phila., 1870. T. A. Conrad.

Formation: Eocene [Cretaceous].

Location: Shark river, New Jersey.

—— littoralis (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 212, 213, pl. 28, figs. 6, 7. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Shark river and Squankum, and doubtfully from Farmingdale, N. J.

—— monmouthensis n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 302, 303, pl. 48, fig. 20 [19]. Phila. 1858–1860. Wm. M. Gabb.

Formation: Cretaceous.

Location: Monmouth and Burlington counties, New Jersey.

Crassatella—Continued..

—— **monmouthensis** (Gabb) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 119, 120, pl. 17, figs. 21, 22. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Monmouth, N. J.

—— ? **parvula** n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861-1862, p. 202. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Fannin county, Texas.

—— **prora** n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869-1870, p. 43, pl. 1, fig. 8. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **prora** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 120-121, pl. 17, figs. 10-11. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **pteropsis** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 279, pl. 46, fig. 9. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Mississippi.

—— **pteropsis** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860., p. 395, pl. 68, fig. 28. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tennessee, and Eufaula, Ala.

—— **pteropsis** (Gabb, not Con.) Conrad. (1869.)

Amer. Jour. Conch., vol. 5, Phila., 1869–1870, pp. 47–48. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Tennessee and Alabama; Haddonfield, N. J.; Mississippi.

—— **pteropsis** Conrad. (1872.)

Proc. Acad. Nat. Sci., Phila., for 1872, p. 50, pl. 1, fig. 1. Phila., 1872. T. A. Conrad.
Formation: Cretaceous.

—— **pteropsis** ? Conrad. (1875.)

Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 6, pl. 1, fig. 25. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— **pteropsis** (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 310. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Georgia; North Carolina.

—— **rhombea** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 213, 214, pl. 27, figs. 16–19. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Egypt and Squankum, N. J.

Crassatella—Continued.

—— **ripleyana** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 327, pl. 35, fig. 3. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, 3 miles north of the town of Ripley, Miss.

—— **ripleyana** Conrad. (1872.)

Proc. Acad. Nat. Sci., Phila., for 1872, p. 50 [pl. 1], fig. 7. Phila., 1872. T. A. Conrad.
Formation: Cretaceous.

—— **shumardi** n. s. Meek. (1876.)

Rep. Expl. Exped. Santa Fe, N. Mex., to junction of Grand and Green rivers, pp. 127, 128, pl. 2, figs. 7*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Pope's Well.

—— **subplana** n. s. Conrad. (1853.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d. ser., 1850-1854, p. 274, pl. 24, fig. 9. Phila., 1850-1854. T. A. Conrad.
Formation: Cretaceous.
Location: Arneytown, N. J.

—— **subplana** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 121, 122, pl. 18, figs. 14–16. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Bruere's pits, on Crosswicks creek, near Walnford, and near Cream Ridge, New Jersey.

—— **subplana** ? (Con.) Hill. (1889.)

Geol. Sur. Texas, Bull. No. 4, p. 11. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Two miles north of Webberville, Tex.

—— **subquadrata** n. s. Whitfield. (1877).

U. S. Geogr. and Geol. Sur. Rocky Mt. region: Prelim. Rep. Paleont. Black Hills, p. 34. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On Cheyenne river [S. Dakota].

—— **subquadrata** Whitfield. (1880.)

Rep. Geol. Black Hills of Dakota, pp. 412, 413, pl. 11, fig. 12. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river [S. Dakota].

—— **transversa** n. s. Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, pp. 364, 365. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **transversa** (Gabb) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 122, 123, pl. 17, figs. 16, 17. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

—— **tuscana** (Gabb) White. (1889.)

Bull. U. S. Geol. Sur., No. 51, pp. 39, 40, pl. 6, figs. 2–4. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia and Waldron islands.

Crassatella—Continued.

—— **vadosa** n. s. Morton. (1834.)
Synop. Org. Rem., Cret. Gr. U. S., p. 66, pl. 13, fig. 12. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie Bluff, Alabama.

—— **vadosa** (Morton) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 310, 311. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.

—— **vadosa** (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 116, 117, pl. 17 figs. 12-15. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, Freehold, and Burlington, N. J.

—— **uvasana** n. s. Conrad. (1855.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean. App. Prelim. Geol., Rep. of W. P. Blake. Pal., p. 9. Wash., 1855. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada de las Uvas.

—— **uvasana** Conrad. (1856.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean, vol. 5, App., pp. 320, 321, pl. 2, fig. 5. Wash., 1856. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada de las Uvas.

—— **sp. undet.** Owen. (1860.)
Second Rep. Geol. Rec., Arkansas, pl. 8, fig. 5. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— **sp. undet.** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 311. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Georgia.

—— (**Pachythærus**) **carolinensis** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875, W. C. Kerr., App. A, p. 6, pl. 2, fig. 24. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

—— (**Pachythærus**) **evansi** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 117, 118, pl. 17, figs. 6a–d. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Sage creek, on the Cheyenne [S. Dakota].

Crassatellina n. g. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 300, 301. Wash., 1871. F. B. Meek.

—— **oblonga** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 301, figs. A and B text. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

Crassatellina—Continued.

—— **oblonga** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 120, 121, pl. 2, figs 3a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kansas.

Crenella (Brown) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858–1860, p. 281. Phila., 1858–1860. T. A. Conrad.

—— (Brown) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 75. Wash., 1876. F. B. Meek.

—— **concentrica** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 186, pl. 24, fig. 169. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **elegantula** n. s. M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 441, 442. Phila., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Deer creek, near north branch Platte river [Wyoming]; Yellowstone river, Nebraska [Montana].

—— **elegantula** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 75, 76, pl. 28, figs. 6a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Deer creek, near North Platte [Wyoming].

—— **elegantula** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 181. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek, Colorado.

—— ? **parvula** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 57, pl. 9, fig. 1. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Milk River ridge, Canada.

—— **serica** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 281, pl. 46, fig. 23. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

Crescis n. g. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–1863, p. 177. Phila., 1862, 1863. Gabb & Horn.

—— **labiata** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phil., vol. 5, 2d ser., 1862–1863, pp. 177, 178 [pl, 21], fig. 69. Phila., 1862–1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica Hill and at Timber creek, New Jersey.

Criocardium n. subgen. Conrad. (1870.)
Am. Jour. Conch., vol 6, Phila., 1870–1871, p. 75. Phila., 1871. T. A. Conrad.

Criocardium—Continued.

—— (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 214. Wash., 1885. R. P. Whitfield.

—— **nucleolus** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 214, 215, pl. 28, figs. 10, 11. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Buckelew and Corliss pits, at Farmingdale, N. J.

Crioceras (d'Orb.) Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 266. Phila., 1856. T. A. Conrad.

—— **latus** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 76, 77, pl. 15, figs. 25, 25*a*; pl. 14, fig. 25*b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Weaverville, in the Trinity river, Trinity county, California, from a bowlder.

—— **percostatus** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 77, 78, pl. 16, fig. 26, pl. 17, fig. 26*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Arbuckle's diggings, Shasta county, on the shore of the straits of Carquinez, west of Martinez, Cal.

—— (**Ammonceras**) **conradi** (Mort.) Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 366. Phila., 1856. T. A. Conrad.
Formation: Cretaceous.
Location: Walnford, Ocean county, New Jersey.

—— (**Ancyloceras?**) **rémondi** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 75, 76, pl. 14, figs. 24, 24*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, California.

Cristellaria (Lam.) Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band xliv, p. 335. Wien, 1862. A. E. Reuss.

—— **alta** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 37. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **baylei** n. s. Reuss. (1861.)
Math-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band XLIV., Taf. vii, fig. 7. Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

—— **intermedia** var. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band XLIV, p. 336, Taf. viii, fig. 2. Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

Criocardium—Continued.

—— **rotulata** (?) (d'Orb.) Schlumberger. (1882.)
Jour. Cincinnati Soc. Nat. Hist., vol. 5, p. 119, pl. 5, figs. 2, 2a. Cincinnati, 1882. C. Schlumberger.
Formation: Cretaceous.
Location: Near Livingston, Ala.

—— **sp. undet.** Lyell. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, p. 64, figs. *b* and *c*. London, 1845. Charles Lyell.
Formation: Cretaceous.
Location: Timber creek, New Jersey.

Crypta (Humph.) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 136. Phila., 1864. W. M. Gabb.

—— (**Spirocrypta**) **pileum** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 137, pl. 29, figs. 233, 233*a*–*b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

Cryptorhytis n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 356. Wash., 1876. F. B. Meek.

Ctenoides (Klein.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 329. Phila., 1855–1858. T. A. Conrad.

—— **acutilineata** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 329, pl. 34, fig. 2. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **denticulicosta** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 327. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Tennessee.

—— **squarrosa** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 366. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Alabama.

Cucullæa (Lam.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.

—— (Lam.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 84. Wash., 1886. F. B. Meek.

—— **antrosa** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 65, pl. 13, fig 6. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **capax** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 328, pl. 35, fig. 2. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Cucullæa—Continued.

—— **exigua** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 275, 276. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Milk river, Nebraska [Montana].

—— **haguei** n. s. Meek. (1870.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 134, 135, pl. 12, figs. 1, 1a, b. Wash., 1877. F. B. Meek.
Formation: Jurassic.
Location: Weber cañon, Wasatch range, Utah.

—— **increbescens** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 65, pl. 14, figs. 5, 6. Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Kialagvic bay, Alaska.

—— **inermis** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 271, 272, pl. 36, fig. 18. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **insularis** n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, p. 168, Taf. 15, figs. 6, 7. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **maconensis** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 281, pl. 47, fig. 20. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Chunennugga ridge, Macon county, Alabama.

—— **mathewsonii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 195, 196, pl. 31, fig. 266. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez; Clayton, Cal.

—— **millestriata** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861–1862, p. 202. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Lamar county, Texas.

—— **nebrascensis** n. s. Owen. (1852.)
Rep. Geol. Sur. Wis., Iowa, Minn., p. 582, pl. 8, figs. 1, 1a. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Fox hills, between the Cheyenne and Moreau rivers [S. Dakota].

—— **neglecta** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 326. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **terminalis** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 148, pl. 4, figs. 2a, b. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: [Texas.]

Cucullæa—Continued.

—— **tippana** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 328, pl. 35, fig. 1. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **transversa** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 326. Phila., 1862. Wm. M. Gabb.
Formation: Cretaceous.
Location: Arneytown? N. J.

—— **truncata** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 196, pl. 25, fig. 182. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Curry's; south of Mount Diablo; Tuscan springs, Tehama county; Benicia; Martinez; Texas Flat, Placer county; many points in the coast range, on the east side between Mount Diablo and Pacheco's pass, California; Jacksonville, Oregon.

—— **truncata** (Gabb?) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, pp. 38, 39. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island.

—— **vulgaris** n. s. Morton. 1830.
Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.
Formation: [Cretaceous].
Location: United States.

—— **vulgaris** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 21. New Haven, 1830. S. G. Morton.

—— **vulgaris** Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 199. Phila., 1827–1831. S. G. Morton.
Formation: [Cretaceous.]

—— **vulgaris** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 64, 65, pl. 3, fig. 8; pl. 13, fig. 5. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **vulgaris** (Mort.) Emmons. (1858.)
Rep. N. Carolina Geol. Sur., p. 278, fig. B. Raleigh, 1858. E. Emmons.
Formation: Cretaceous.
Location: Black Rock, on the Cape Fear, North Carolina.

—— **vulgaris** (Morton) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 326. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **(Idonearca?) cordata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 89, 90, pl. 29, figs. 6a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river and Long lake [S. Dakota].

Cucullæa—Continued.

—— (Idonearca) nebrascensis (Owen). Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 88, 89, pl. 29, figs. 5*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fox hills and Moreau river [S. Dakota].

—— (Idonearca) shumardi (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 86, 87, pl. 28, figs. 15*a–g*, pl. 29, fig. 4. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Fox hills, Long lake, etc.

—— (Idonearca) truncata (Gabb) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 165–167, pl. 19, figs. 2, 2*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: West side of Hornby island, Gabriola island, Nanaimo river, two miles and a half up, and Northwest bay, Vancouver island.

—— (Idonearca) sp. undet. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 5, p. 265. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island.

—— (Trigonarca?) obliqua n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 148, 149, pl. 14, figs. 1*a*, *b*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: East Cañon creek, Wasatch range, Utah.

—— (Lam.) Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, pp. 44, 45. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: New Jersey.

—— sp. undet. Roemer. (1849.)

Texas, pp. 403, 404. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall, near New Braunfels, Tex.

—— sp. undet. Roemer. (1849.)

Texas, p. 404. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 53. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 52, Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

Cucullæa—Continued.

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 430. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Dodson's ranche.

—— (?) sp. undet. Whiteaves. (1876.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, p. 73. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— (?) sp. undet. Whiteaves. (1878.)

Canadian Naturalist, vol. 8, n. ser., No. 7, p. 404. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— (?) sp. undet. Whiteaves. (1878.)

Geol. Sur. Can., Rep. Prog. for 1876–1877, p. 154. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— sp. undet. Whiteaves. (1882.)

Proc. and Trans. Roy. Soc., Can., vol. 1, sec. 4, p. 85. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Jackass mountain, Canada.

Cultellus (Con.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 303. Phila., 1858–1860. Wm. M. Gabb.

—— cretaceus n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 303, 304, pl. 48, fig. 25. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, New Jersey.

Cyclas subgen. (H. & A. Ad.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 131. Wash., 1876. F. B. Meek.

—— formosa n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 115. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles above Fort Union [N. Dakota].

—— fragilis n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 115. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles above Fort Union [N. Dakota].

—— subellipticus n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 115. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles above Fort Union [N. Dakota].

nera n. subgen. Conrad. (1866)
Jour. Conch., vol. 2, p. 78. Phila., 1866.
A. Conrad.

hyris n. g. Conrad. (1875.)
Geol. Sur. N. Carolina, vol. 1, Raleigh, 1875.
C. Kerr., App. A, p. 8. T. A. Conrad.

a n. s. Conrad. (1875.)
Geol. Sur. N. Carolina, vol. 1, Raleigh, 1875.
C. Kerr., App. A, p. 8, pl. 2, fig. 4. T. A.
rad.
ation: Cretaceous.
ion: Snow Hill, Greene county, North Caro-

rolinensis n. s. Conrad. (1875.)
Geol. Sur. N. Carolina, vol. 1, Raleigh, 1875,
C. Kerr., App. A, p. 8, pl. 2, fig. 3. T. A.
rad.
ation: Cretaceous.
ion: Snow Hill, Greene county, North Caro-

na (Loven) Shumard. (1861.)
Boston Soc. Nat. Hist., vol. 8, 1861-1862, p.
Boston, 1862. B. F. Shumard.

stata n. s. Gabb. (1864.)
Sur. Cal., Paleont., vol. 1, pp. 143, 144, pl.
fig. 107. Phila., 1864. W. M. Gabb.
ation: Cretaceous.
ion: Martinez; Texas Flat, Placer county;
ton; Cochran's, east of Mount Diablo; San
go; Alizos creek, near Fort Tejon, Cal.

nuscula n. s. Shumard. (1861.)
Boston Soc. Nat. Hist., vol. 8, 1861–1862, p.
Boston, 1862. B. F. Shumard.
ation: Cretaceous.
ion: Red river, Lamar county, Texas.

tula n. s. M. & H. (1860.)
Acad. Nat. Sci., Phila., for 1860, p. 178.
a., 1861. Meek & Hayden.
ation: Cretaceous.
on: Moreau river, Nebraska [S. Dakota].

tula (M. & H.) Meek. (1876.)
J. S. Geol. Sur. Terr., vol. 9, pp. 276, 277,
1, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
tion: Cretaceous.
on: Moreau river [S. Dakota.]

tula (M. & H.) White. (1879.)
th Ann. Rep. U. S. Geol. and Geogr. Sur.
., p. 184. Wash., 1879. C. A. White.
tion: Cretaceous.
on: Mouth of St. Vrains creek and in the val-
f the Cache à la Poudre, Colorado.

atella n. s. Shumard. (1861.)
Boston Soc. Nat. Hist., vol. 8, 1861–1862,
94, 195. Boston, 1862. B. F. Shumard.
tion: Cretaceous.
on: Navarro county, Texas.

olvaria (M. & H.) Meek. (1876.)
. S. Geol. Sur. Terr., vol. 9, pp. 275, 276,
1. figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
tion: Cretaceous.
on: Moreau river [S. Dakota].

Cylichna—Continued.

—— **(Bulla) sp. undet. Hill. (1889.)**
Geol. Sur. Texas, Bull. No. 4, p. 20. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: San Antonio, Tex.

Cylindrites (Morris & Lycett) Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 115. Phila., 1864. W. M. Gabb.

—— **brevis n. s. Gabb. (1864.)**
Geol. Sur. Cal., Paleont., vol. 1, p. 15, pl. 29, fig. 223. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Vicinity of Martinez, Ca

Cymbophora n. g. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 180. Phila., 1869. W. M. Gabb.

—— **subgen. (Gabb) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 204. Wash., 1876. F. B. Meek.

—— **ashburnerii Gabb. (1869.)**
Geol. Sur. Cal., Paleont., vol. 2, p. 181. Phila. 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Typical localities of the Chico, Tejon, and Martinez groups, California.

—— **ashburnerii (Gabb) Whiteaves (1879.)**
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 141, 142, pl. 17, fig. 8. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island; Gabriola island; Blunden point, Vancouver island; Protection and Sucia islands.

—— **lintea (Con.) Gabb. (1876.)**
Proc. Acad. Nat. Sci., Phila., for 1876, p. 306. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: [Patanla creek, Georgia?]

—— **lintea Conrad. (1877.)**
Proc. Acad. Nat. Sci., Phila., for 1877, p. 24. Phila., 1877. T. A. Conrad.
Formation: Cretaceous.
Location: California, New Jersey, and North Carolina.

Cymella n. g. Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 34. Wash., 1864. F. B. Meek.

—— **(subgen. Meek) White. (1875.)**
Rep. Geogr. and Geol. Expl. and Sur. West of One Hundredth Meridian, vol. 4, pt. 1, p. 187. Wash., 1875. C. A. White.

—— **bella n. s. Conrad. (1875.)**
Rep. Geol. Sur. North Carolina, vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 10, pl. 2, fig. 9. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

Cymella—Continued.

—— **meeki** Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 142, 143, pl. 20, figs. 6, 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Marlborough, Monmouth county, near Keyport, N. J.

—— **undata** (M. & H.) Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 34. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Idaho.

Cyphosoma (Agas.) Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 276. Phila., 1869. Wm. M. Gabb.

—— **speciosum** n. s. Clark. (1891.)
Johns Hopkins Univ. cir. vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous.
Location: New Jersey.

—— **texanum** n. s. Roemer. (1852.)
Kreide. von Texas, pp. 82, 83, Taf. 10, figs 6a–c. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba valley, Texas.

—— **texanum** (Roem.) Hall. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 146, pl. 1, figs. 3a–c. Wash., 1857. James Hall.
Formation: Cretaceous.
Location: Leon Springs, Texas.

—— **texanum** (Roem.) Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 276. Phila., 1869. Wm. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

Cypræa (Linn.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 282. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location: Chesapeake and Delaware canal.

—— ? **bayerquei** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, pp. 129, 130, figs. in text. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Clayton, Contra Costa county, California.

—— **mortoni** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 391, pl. 68, fig. 8 [9]. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Prairie Bluff, Alabama, and Burlington county, New Jersey.

—— (**Epona**) **mathewsonii** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 164, pl. 27, figs. 44a–b. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Cypræa—Continued.

—— (**Luponia**) **bayerquei** Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2. pp. 163, 164, pl. 2, figs. 43a–c. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 60. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Chesapeake and Delaware canal.

Cypricardia (Lam.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, p. 176. St. Petersburg, 1871. E. Eichwald.

—— **leidyi** n. s. Lea. (1855.)
Proc. Acad. Nat. Sci. Phila., vol. 7, p. 341, pl. 4. fig. 2. Phila., 1856. Isaac Lea.
Formation: [Triassic ?]
Location: Near Pottsville, Pa.

—— ? **texana** n. s. Roemer. (1849.)
Texas, pp. 404, 405. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **texana** Roemer. (1852.)
Kreide. von Texas, pp. 50, 51, Taf. 6, figs. 6a–c. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— (**Crassatella**) **trapezoidalis** (Röm.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halbins. Mang. u. Aleutischen Inseln, pp. 176, 177, Taf. 15, figs. 4, 5. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

Cyprimeria n. g. Conrad. (1864.)
Proc. Acad. Nat. Sci., Phila., for 1864, p. 212. Phila., 1864. T. A. Conrad.

—— **alta** n. s. Conrad. (1875.)
Rep. Geol. Sur. North Carolina, vol. 1. Raleigh, 1875. W. C. Kerr, app. a, p. 27. T. A. Conrad.
Formation: Cretaceous.

—— ? **crassa** n. s. Meek. (1876.)
Rep. Expl. Exped., Santa Fe, N. Mex., to junction of Grand and Green rivers, p. 128, pl. 1, figs. 8a–d. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Pope's Well.

—— **cretacea** Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 9, pl. 9, fig. 12. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **cretacensis** Conrad. (1867.)
Am. Jour. Conch., vol. 3, p. 9. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.

—— **densata** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 157, 158, pl. 22, figs. 19–21. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel and Burlington, N. J.

neria—Continued.

ɜpressa n. s. Conrad. (1875.)
Geol. Sur. North Carolina, vol. 1. Raleigh, 75. W. C. Kerr. App. A, p. 9. T. A. Conrad.
ɔation: Cretaceous.
tion: Snow Hill, Greene county, North rolina.

ɜpressa (Con.) Gabb. (1876.)
. Acad. Nat. Sci., Phila., for 1876, p. 308. ila., 1876. Wm. M. Gabb.
ıation: Cretaceous.
tion: Georgia.

ɔpressa (Con.) Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, pp. 156, 157, pl. 22, s. 11-13. Wash., 1885. R. P. Whitfield.
ıation: Cretaceous.
tion: Haddonfield and Freehold, N. J.

:cavata (Morton) Conrad. (1864.)
Acad. Nat. Sci., Phila., for 1864, p. 212, fig. text. Phila., 1864. T. A. Conrad.
ıation: Cretaceous.
tion: Arneytown, N. J.

:cavata (Mort.) Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, pp. 159, 160, pl. 22, ı. 16, 17. Wash., 1885. R. P. Whitfield.
ıation: Cretaceous.
tion: Holmdel and elsewhere in Monmouth nty, New Jersey.

ɔilprini n. s. Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, p. 160, pl. 22, figs. 15. Wash., 1885. R. P. Whitfield.
ıation: Cretaceous.
tion: Crosswicks, N. J.

ns (Gabb) Whiteaves. (1879.)
Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 152. ntreal, 1879. J. F. Whiteaves.
ıation: Cretaceous.
:ion: Northwest side of Hornby island; Su- islands.

ns (Gabb) White. (1889.)
U. S. Geol. Sur. No. 51, p. 42. Wash., 1889. A. White.
ation: Cretaceous.
tion: Waldron island.

issa n. s. Conrad. (1869.)
Jour. Conch., vol. 5, Phila., 1869-1870, p. pl. 1, fig. 9. Phila., 1870. T. A. Conrad.
ation: Cretaceous.
ion: Crosswicks, N. J.

issa (Con.) Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, pp. 160, 161, pl. 22, 18. Wash., 1885. R. P. Whitfield.
ation: Cretaceous.
ion: Holmdel, Monmouth county, New Jer- .

subalata Meek. (1877.)
Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, 158, 159, pl. 15, fig. 7. Wash., 1877. F. B. ek.
ation: Cretaceous.
ion: East cañon, Wasatch range, Utah.

Cyprimeria—Continued.

—— ? subalata (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? tenuis Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 361, pl. 2, figs. 5, 5a, and 5b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Nanaimo, Vancouver's island, and on Newcastle island.

—— torta n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876. pp. 308, 309. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Georgetown, Ga.

Cyprina (Lam.) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861-1862, p. 294. Boston, 1862. B. F. Shumard.

—— arenarea n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 143. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Big Sioux river, two miles above the mouth, Nebraska.

—— compressa n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 144. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebraska [S. Dakota].

—— cordata n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 143. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebraska [S. Dakota].

—— ? dallii n. s. White. (1884.)
Bull. U. S. Geol. Sur. No. 4, p. 14, pl. 6, fig. 1. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Fossil Point, Port Möller, Alaska.

—— humilis n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 179, 180. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: North branch of Cheyenne river, near Black Hills, Nebraska [S. Dakota].

—— laphami n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 204. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Fannin county, Texas.

—— occidentalis n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 227, 228, fig. 10, p. 227. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford Bay.

Cyprina—Continued.

—— occidentalis Whiteaves. (1889.)

Geol. and Nat. His. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 169. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky Mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— ovata n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 144. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Heart river, Nebraska.

—— ovata (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 146, 147, pl. 29, figs. 7a-c and fig. 8, p. 146. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Heart river [S. Dakota].

—— ovata (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 40. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, near and a little west of the mouth of St. Mary river, also below Horseshoe bend; St. Mary river, near its confluence with the Belly river; St. Mary river, west of MacLeod-Benton trail; South Saskatchewan, opposite Swift Current creek; Ross Coulée, near Irvine station, on the Canadian Pacific railway, Canada.

—— ovata (M. & H.) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 175. Montreal, 1889. J. F. Whiteaves.
Formation; Cretaceous.
Location: Battle river, township 40, range 13, west of the fourth principal meridian, and township 40, range 15, west of the same meridian, Northwest Territory.

—— ovata var. alta n. var. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 40, pl. 5, fig. 3. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, near and a little west of the mouth of St. Mary river, also below Horseshoe bend; St. Mary river, near its confluence with the Belly river; St. Mary river, west of MacLeod-Benton trail; South Saskatchewan, opposite Swift Current creek; Ross Coulée, near Irvine station, on the Canadian Pacific railway, Canada.

—— ovata var. compressa Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 147, pl. 30, fig. 11. Wash., 1876. F. B. Meek.
Formation: Cretaceous.

—— subtrapeziformis Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1. pt. 2, p. 176. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Battle river, township 46, range 4, west of the fourth principal meridian, Northwest Territory.

Cyprina—Continued.

—— subtumida n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 144. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, Nebraska [Montana].

—— yukonensis n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 160, pl. 21, fig. 4. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rink rapids, on the Lewis river, a tributary of the Yukon, lat. 60° 30′, long. 13 30′, Northwest Territory.

—— ? sp. undet. Roemer. (1849.)

Texas, p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Upper course of Pedernales river, Texas.

—— ? sp. undet. Roemer. (1849.)

Texas, pp. 406, 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Upper course of Pedernales river, Texas.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 47. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of Pedernales river, Texas.

—— sp. undet. Roemer. (1852.)

Kreide. von. Texas, p. 47. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of Pedernales river, Texas.

—— sp. undet. Toula. (1874.)

Die Zwiete Deutsche Nordpolarfahrt. Zweiter Band, p. 505. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous?].
Location: Kuhn island, east coast of Greenland.

Cyprinella n. g. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 170. Phila., 1864. W. M. Gabb.

—— tenuis n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 170, 171, pl. 23, figs. 151, 151a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: South Side of Corral hollow; Contra Costa county, California.

Cyprinopsis n. g. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869-1870, p. 101. Phila., 1870. T. A. Conrad.

—— ovalis (Gabb) Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869-1870, p. 101. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: California.

Cypris purbeckensis ? (Forbes) White. (1886.)

Bull. U. S. Geol. Sur., No. 29, p. 24. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Canyon city, Colo.

Cypris—Continued.

—— **sp. undet. White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 246. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyoming.

—— **sp. undet. (Jones) White. (1886.)**
Bull. U. S. Geol. Sur., No. 29, p. 24. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Canyon city, Colo.

—— **sp. undet. (Jones) White. (1886.)**
Bull. U. S. Geol. Sur., No. 29, p. 24. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Canyon city, Colo.

Cyrena (Lamarck) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil). Smithson. Misc. Coll., vol. 7, No. 145, pp. 11, 12. Wash., 1865. T. Prime.

—— **(Lamarck) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 157. Wash., 1876. F. B. Meek.

—— **brevidens n. s. White. (1889.)**
Bull. U. S. Geol. Sur., No. 51, pp. 58, 59, pl. 10, figs. 8–11. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Palace Camp, Washington.

—— **carletoni n. s. (Meek) White. (1873.)**
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 495, 496. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— **carletoni (Meek) White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **carletoni (Meek) White. (1880.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 20, 21, pl. 12, figs. 16*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **carletoni (Meek) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 436, pl. 5, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **dakotensis (M. & H.) Prime. (1865.)**
Mon. Am. Corbiculadæ (Recent and Fossil). Smithson. Misc. Coll., vol. 7, No. 145, p. 31. Wash., 1865. T. Prime.
Formation: Cretaceous.
Location: At mouth of Big Sioux or Dakotah river.

—— **dakotensis (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 159, 160, pl. 1, figs. 1*a*–*f*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of the Big Sioux river, on the Missouri.

Cyrena—Continued.

—— **dakotensis (M. & H.) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 436, pl. 4, figs. 3, 4. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southeastern Dakota.

—— **? holmesi n. s. Meek. (1875.)**
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 1, No. 1, 2d ser., pp. 45, 46. Wash., 1875. F. B. Meek.
Formation: Tertiary? [Cretaceous.]
Location: Ralston creek, three to four miles north of Golden city, Colo.

—— **inflexa (Meek) White. (1879).**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 290, pl. 10, figs. 7*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Missouri river, below Gallatin City, Mont.

—— **intermedea n. s. M. & H. (1856.)**
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 116. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Near Moreau river [S. Dakota].

—— **moreauensis n. s. M. & H. (1856.)**
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 115, 116. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Near Moreau river [S. Dakota].

—— **occidentalis n. s. M. & H. (1856.)**
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 116. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Bad Lands of the Judith [Montana].

—— **securis (Meek) White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyoming.

—— **securis (Meek) White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 250. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyoming.

—— **securis (Meek) White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 289, pl. 3, figs. 2*a*–*c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyoming.

—— **(Corbicula ?) arkansaensis n. s. Hill. (1888.)**
Ann. Rep. Geol. Sur. Arkansas for 1888, vol. 2, pp. 133, 134, pl. 2, fig. 20; pl. 4, figs. 3, 3*a*, *b*. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous.
Location: Arkansas.

—— **(Corbicula ?) cytheriformis n. s. M. & H. (1860.)**
Proc. Acad. Nat. Sci., Phila., for 1860, p. 176. Phila., 1861. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Near the mouth of Judith river, Nebraska [Montana].

Cyrena—Continued.

—— **(Corbicula) durkeei** n. s. **Meek.** (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 431. Phila., 1871. F. B. Meek.

Formation: Tertiary [Cretaceous].

Location: Wyoming.

—— **(Veloritina) durkeei (Meek) White.** (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of One Hundredth Meridian, vol. 4, pt. 1, pp. 207, 208, pl. 21, figs. 13*a*, *b*. Wash., 1875. C. A. White.

Formation: Eocene ? [Cretaceous].

Location: Plateau near the west crossing of the north fork of Virgin river, at Pace's cañon, and at the north fork of Virgin river, Utah.

—— **(Veloritina) erecta** n. s. **White.** (1876.)

Rep. Geol. Uinta Mts., p. 117. Wash., 1876. C. A. White.

Formation: Cretaceous.

Location: Upper Kanab, Utah, and Hilliard station, Wyoming.

—— n. s. **Hill.** (1889.)

Geol. Sur. Texas, Bull. No. 4, p. 14. Austin, 1889. R. T. Hill.

Formation: Cretaceous.

Location: Barton's creek, west of Austin, Tex.

Cyrtochilu n. subgen. **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 392. Wash., 1876. F. B. Meek.

Cytherea [Lam.] Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 67. Phila., 1834. S. G. Morton.

—— **deweyi** n. s. **M. & H.** (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 83. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Moreau river, Nebraska [S. Dakota].

—— **excavata** n. s. **Morton.** (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 292, pl. 5, fig. 1. New Haven, 1833. S. G. Morton.

Formation: [Cretaceous].

Location: New Jersey.

—— **excavata** n. s. **Morton.** (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 67, pl. 5, fig. 1. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Arneytown, N. J.

—— **leonensis** n. s. **Conrad.** (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pl. 6, fig. 1. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Leon Springs, El Paso road [Texas].

—— **missouriana** n. s. **Morton.** (1841.)

Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 210, pl. 11, fig. 2. Phila., 1839–1842. S. G. Morton.

Formation: Cretaceous.

Location: Great bend of the Missouri river (lat. 43° 40′ N.).

Cytherea—Continued.

—— **missouriana (Mort.) Marcou.** (1858.)

Geol. N. Am., p. 42. Zurich, 1858. Jules Marcou.

Formation: Cretaceous.

Location: Between Gold mount and the villages of Galisteo and Algodones, in New Mexico.

—— **nebrascensis** n. s. **M. & H.** (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 83. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Moreau river, Nebraska [S. Dakota].

—— **orbiculata** n. s. **H. & M.** (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 382, 383, pl. 1, fig. 7. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: On the Missouri, five miles below James river.

—— **owenana** n. s. **M. & H.** (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 273. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Mouth of Judith river, Nebraska [Montana].

—— **pellucida** n. s. **M. & H.** (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, pp. 272, 273. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Two hundred miles above mouth of Milk river, Nebraska [Montana].

—— **tenuis** n. s. **H. & M.** (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 383, pl. 1, figs. 8a–c. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: On the Missouri, five miles below James river.

—— **(Callista) laciniata (Stoliczka) Whiteaves.** (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 148, pl. 17, figs. 13, 13*a*; pl. 19, figs. 4, 4*a*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest side of Hornby island, Sucia islands.

—— **(Caryatis) plana (Sow.) Whiteaves.** (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 149–151, pl. 17, figs. 14, 14*a*, *b*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest side of Hornby island; entrance to Departure bay, Vancouver island; Sucia islands.

—— **texana** n. s. **Conrad.** (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 153, pl. 6, fig. 2. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera.

—— **lamarensis (Shumard) White.** (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 39, pl. 18, figs. 4*a*, *b*. Wash., 1883. C. A. White.

Cytherina (Lam.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 335. Phila., 1855–1858. T. A. Conrad.

—— **tippana** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 335, pl. 35, fig. 31. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 213. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colorado.

Dalliconcha n. g. White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, pp. 34, 35. Phila., 1887. C. A. White.

—— **invaginata** n. s. White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, p. 35, pl. 2, figs. 4 and 5. Phila., 1887. C. A. White.
Formation: Cretaceous.
Location: [Four miles north of Fort Worth], Texas.

—— **ensiformis** (Conrad) White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, pl. 2, fig 6. Phila., 1887. C. A. White.

Daphnella? (Hinds) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 285. Phila., 1858–1860. T. A. Conrad.

—— ? **eufaulensis** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 285. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— ? **lintea** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 285, 286, pl. 46, fig. 47. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— ? **subfilosa** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 285. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

Delphinula lapidosa n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 46, pl. 19, fig. 7. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie Bluff, Ala.

—— ? Troost. (1840.)
Fifth Geol. Rep., Tennessee, p. 56. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: Near Purdy, McNairy county, Tennessee.

Dentalina (d'Orb.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 402. Phila., 1858–1860. Wm. M. Gabb.

Dentalina—Continued.

—— (d'Orb.) Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band xliv, p. 334. Wien, 1862. A. E. Reuss.

—— **americana** Ehrenberg. (1851.)
Mikrogeologie, Taf. 32, fig. 3. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **colligata** n. s. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band xli v, pp. 334, 335, Taf. vii, fig. 4. Wien, 1862. A. E. Reuss.

—— **confluens** n. s. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band xliv, p. 335, Taf. vii, fig. 5. Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

—— **pulchra** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 402, 403, pl. 68, figs. 40, 41. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Near Mullica Hill, N. J.

Dentalium [Linn.] Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 276. Phila., 1850–1854. T. A. Conrad.

—— **cooperi** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 139, pl. 21, fig. 100. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: San Diego, Martinez, near Fort Tejon; Curry's, south of Mount Diablo, and in the Siskiyou mountains, California.

—— **cooperi** (Gabb?) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 44. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island.

—— **falcatum** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, pp. 44, 45, pl. 1, figs. 12–16. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **fragilis** n. s. M. & H. 1856.
Proc. Acad. Nat. Sci., Phila., for 1856, p. 69. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above mouth, Nebraska [Montana.]

—— **gracile** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 266, 267, pl. 18. fig. 13*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone River [Montana.]

—— **gracile** (H. & M.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of St. Vrains creek and in the valley of the Cache à la Poudre, Colorado.

Dentalium—Continued.

—— gracile (H. & M.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— gracile (H. & M.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dakota, pp. 438, 439, pl. 12, fig. 26. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river near Rapid creek, Black Hills.

—— gracilis n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 393, pl. 3, figs. 11*a–c*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek [Wyoming.]

—— komooksense [nanaimoensis] Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 364. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo? Vancouver's island.

—— nanaimoense (Meek) Whiteaves. 1879.

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 133, 134, pl. 16, figs. 9, 9*a–b*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Denman island, southwest side; two miles and a quarter up the Nanaimo river, Vancouver island; Sucia island.

—— nanaimoensis n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, pp. 44, 45. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver's island.

—— pauperculum n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 178. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebraska [S. Dakota.]

—— polygonum (Reuss) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 238. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— ripleyanum n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 393, pl. 68, fig. 17 [pl. 63, fig. 48]. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— stramineum n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 139, 140, pl. 21, fig. 101. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Northeast of Martinez, San Diego; Curry's, south of Mount Diablo, California.

Dentalium—Continued.

—— subarcuatum n. s. Conrad. (1853.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 276, pl. 24, fig. 13. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: New Egypt, N. J.

—— ? subquadratum n. s. Meek. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 311. Phila., 1861. F. B. Meek.
Formation: Jurassic.
Location: Red Buttes, on the North Platte, lat. 42° 50′ north, long. 106° 40′ west.

—— ? subquadratum (Meek) M. & H. (1865.)

Paleont., Upper Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 111, fig. 1, text. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: North Platte river, at the Red Buttes, lat. 42° 50′ N., long. 106° 40′ W.

—— ? subquadratum Meek. (1876.)

Rep. Exp. Great Basin Terr. Utah, p. 357, pl. 3, figs. 1*a–c*. Wash., 1876. F. B. Meek.
Formation: Jurassic.
Location: On the North Platte, at Red Buttes, lat. 42° 50′ north, long. 106° 40′ west.

—— (Ditrupa?) pusillum n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 139, pl. 21, fig. 99. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Northeast of Martinez, Alizos creek, near Fort Tejon; Tuscan Springs, Cal.

—— [Linn.] Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, p. 44. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: Near Mullica Hill, N. J.

—— Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 281. New Haven, 1830, S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location: Mullica Hill, N. J.

—— sp. undet. Troost. (1840.)

Fifth Geol. Rep. Tennessee, p. 56. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: Near Purdy, McNairy county, Tennessee.

Desmatocium n. g. Gabb. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 518. Phila., 1861. Wm. M. Gabb.

—— trilobatum n. s. Gabb. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 518. Phila., 1861. Wm. M. Gabb.
Formation: Cretaceous.
Location: Near Mullica Hill, N. J.
(See pl. 69, figs. 39, 39*a*, Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser.)

na texanum n. s. Roemer. (1849.)
s, pp. 392, 393. Bonn, 1849. F. Roemer.
ation: Cretaceous.
tion: Fredericksburg and San Saba river,
cas.

xanum Roemer. (1852.)
lc. von Texas, p. 83, Taf. 10, figs. 5*a–c*. Bonn,
2. F. Roemer.
ation: Cretaceous.
ion: Fredericksburg and San Saba valley,
cas.

undet. Roemer. (1852.)
le. von Texas, p. 84. Bonn, 1852. F.
mer.
ation: Cretaceous.
ion: Ford of the Guadalupé, New Braunfels,

ora (Sow.) Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, pp. 58, 59. Wash.,
5. R. P. Whitfield.

hinata (Mort.) Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, pp. 59, 60, pl. 10,
. 3–9. Wash., 1885. R. P. Whitfield.
ation: Cretaceous.
ion: Holmdel, Freehold, and on Mr. Wood-
d's farm, Monmouth county, New Jersey.

oora G. & H. (1862.)
Acad. Nat. Sci., Phil., vol. 5, 2d ser., 1862–
, p. 171. Phila., 1862–1863. Gabb & Horn.

eata n. s. G. & H. (1862.)
Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–
, p. 172 [pl. 21], fig. 62. Phila., 1862-1863.
b & Horn.
ation: Cretaceous.
on: Timber creek and Mullica Hill, N. J.

(Lam.) Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, p. 131. Wash.,
. R. P. Whitfield.

tyloides n. s. Whitfield. (1885.)
U. S. Geol. Sur., vol. 9, p. 131, pl. 18, figs. 26,
Wash., 1885. R. P. Whitfield.
tion: Cretaceous.
on: Bruere's pits near Wainford, on Cross-
s creek, Monmouth county, New Jersey.

undet. Roemer. (1849.)
p. 404. Bonn, 1849. F. Roemer.
ion: Cretaceous.
n: Slope of plateau near New Braunfels,

ındet. Roemer. (1852.)
von Texas, p. 53. Bonn, 1852. F. Roemer.
ion: Cretaceous.
n: Slope of the plateau, near New Braun-
fex.

ina saxipara Ehrenberg.

sologie, Taf. 32, fig. 27. Leipzig, 1854. C.
renberg.
ion: Cretaceous.
n: Mississippi region.

Dione (Gray) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 302. Phila., 1858–1860. Wm. M. Gabb.

—— (subgen. Gray) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 178. Wash., 1876. F. B. Meek.

—— delawarensis n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 302, pl. 48, fig. 19 [18]. Phila., 1858–1860. Wm. M. Gabb.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal and New Jersey.

Diploconcha n. g. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 12. T. A. Conrad.

—— cretacea n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875, W. C. Kerr., App. A, p. 12, pl. 2, fig. 26. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, North Carolina.

Diplodon (subgen. Spix.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Diplopodia malbosi (Desor) Cotteau. (1890.)
Bull. Soc. Géol., France, 3d ser., vol. 18, p. 294. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: Valley of Arivechi, Sonora, Mexico.

Diploschiza n. g. Conrad. (1866.)
Am. Jour. Conch., vol. 2, p. 77. Phila., 1866. T. A. Conrad.

—— cretacea n. s. Conrad. (1866.)
Am. Jour. Conch., vol. 2, p. 77, pl. 9, figs. 2, 3. Phila., 1866. T. A. Conrad.
Formation: Cretaceous.
Location: Alabama.

—— cretacea (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 43, 44, pl. 4, figs. 4–8. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Upper Freehold, N. J.

Diptychoceras n. g. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 143. Phila., 1869. W. M. Gabb.

—— lævis n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 144, 145, pl. 25, figs 21*a–b*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, California.

Discina (Lam.) Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 99. Wash., 1877. F. B. Meek.

Discina—Continued.

—— **pileolus** n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p, 159, pl. 21, figs. 3, 3a. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Rink Rapid, on the Lewes river, a tributary of the Yukon, lat. 60° 20,' long. 136° 30', Northwest Territory.

—— **semipolita** n. s. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 352–354, pl. 33, figs. 9, 9a. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Maud island.

—— **vancouverensis** n. s. Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 177, pl. 20. fig. 6. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Southeast of Ganges harbor, on Salt Spring or Admiralty island.

—— **sp. undet.** Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 99, 100, pl. 10, figs. 3, 3a. Wash., 1877. F. B. Meek.

Formation: Triassic.

Location: Weber cañon, Wasatch range.

Discites (subgen. De Haan.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 491. Wash., 1876. F. B. Meek.

Discohelix (Dunker) Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 119. Phila., 1864. W. M. Gabb.

—— **leana** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 119, 120, pl. 20, fig. 75. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Texas Flat, Placer county, California.

Discoidea (Agas.) Conrad. (1850.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 40. Phila., 1850–1854. T. A. Conrad.

—— **occidentale** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 398, pl. 68, figs. 42–44. Phila., 1858–1860. Wm. M. Gabb.

Formation: Cretaceous.

Location: Oregon.

—— **occidentalis** Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, pp. 323, 324. Phila., 1876. Wm. M. Gabb.

Formation: Cretaceous.

Location: Oregon? Or may be from Peru.

Discorbina globularis (d'Orb.) Dawson. (1874.)

Canadian Naturalist, vol. 7 n. ser., p. 255, fig. 1, c, p. 253. Montreal, 1875. G. M. Dawson.

Formation: Cretaceous.

Location: About twenty miles north of the forty-ninth parallel, on the escarpment called Pembina mountain, Manitoba.

Discoscaphites n. subgen. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 422. Phila., 1871. F. B. Meek.

Ditaxia compressa (Goldf.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 220. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Timber creek, New Jersey.

Donax (Linn.) Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, p. 183. Phila., 1869. W. M. Gabb.

—— **fordii** n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 102, pl. 9, fig. 25. Phila., 1870. T. A. Conrad.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **fordii** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 171, 172, pl. 23, fig. 1. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **latus** n. s. Gabb. (1869.)

Geol. Sur. Cal., Paleont., vol. 2, pp. 183, 184, pl. 30, fig. 75. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Ten miles west of Griswold's, southeast of the Sheep Well, on the road from San Juan to New Idria, Cal.

Dosinia (Scopoli) Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 325. Phila., 1855–1858. T. A. Conrad.

—— **alta** n. s. Conrad. (1855.)

Rep. Expl. and Sur. R. R. R. Miss. river to Pacific Ocean. App. Prelim. Geol. Rep. of W. P. Blake. Pal., p. 9. Wash., 1855. T. A. Conrad.

Formation: Eocene [Cretaceous].

Location: Cañada de las Uvas.

—— **alta** Conrad. (1856.)

Rep. Expl. and Sur. R. R. R. Miss. river to Pacific Ocean, vol. 5, App., p. 320, pl. 2, fig. 2. Wash., 1856. T. A. Conrad.

Formation: Eocene [Cretaceous].

Location: Cañada de las Uvas.

—— **densata** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 325, pl. 34, fig. 13. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **depressa** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 278, pl. 46, fig. 6. Phila., 1858–1860. T. A. Conrad.

Formation: Cretaceous.

Location: Eufaula, Ala.

—— **elevata** n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 167, pl. 32, fig. 252. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Near Fort Tejon, Cal.

ıia—Continued.

erecta n. s. Whitfield. (1885.)
n. U. S. Geol. Sur., vol. 9, pp. 162, 163, pl. 18,
gs. 17-20. Wash., 1885. R. P. Whitfield.
mation: Cretaceous.
ation: Upper Freehold and near Marshall-
ille, N. J.

abbi n. s. Whitfield. (1885.)
ı. U. S. Geol. Sur., vol. 9, pp. 161, 162, pl.
:, figs. 4, 5. Wash., 1886. R. P. Whitfield.
mation: Cretaceous.
ation: Burlington and Freehold, N. J.

yrata n. s. Gabb. (1864.)
l. Sur. Cal., Paleont., vol. 1, p. 168, pl. 23,
;. 148. Phila., 1864. W. M. Gabb.
nation: Cretaceous.
ıtion: Marsh's; southeast of Mount Diablo;
artinez; near San Diego; near the mouth of
e Cañada de las Uvas; at Alizos creek, Cali-
rnia.

yrata (Gabb.) Whiteaves. (1879.)
. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 151.
ontreal, 1879. J. F. Whiteaves.
nation: Cretaceous.
ıtion: Sucia islands.

ıddonfieldensis n. s. Lea. (1861.)
. Acad. Nat. Sci., Phila., for 1861, p. 149.
ila., 1862. Isaac Lea.
ıation: Cretaceous.
tion: Haddonfield, N. J.

flata n. s. Gabb. (1864.)
Sur. Cal., Paleont., vol. 1, p. 168, pl. 23, fig.
. Phila., 1864. W. M. Gabb.
ıation: Cretaceous.
tion: Chico creek, Butte county, California.

rassica n. s. Whitfield. (1877.)
Geogr. and Geol. Sur., Rocky Mt. region;
lim. Rep., Paleont., Black Hills, pp. 23, 24.
sh., 1877. R. P. Whitfield.
ation: Jurassic.
ion: Two miles south of Belle Fourche; and
on the east side of Spearfish creek, near
ction with the Redwater, northeast of Crow
k, Black hills, [S.] Dakota.

:assica Whitfield. (1880.)
eol. Black Hills of Dakota, p. 373, pl. 5, figs.
24. Wash., 1880. R. P. Whitfield.
ation: Jurassic.
ion: East of Belle Fourche; and also on
east side of Spearfish creek, near junction
ı the Redwater, Black hills.

ssouriana ? (Morton) Whitfield.
)
eol. Black Hills of Dakota, pp. 416, 417, pl.
igs. 25, 26. Wash., 1880. R. P. Whitfield.
ıtion: Cretaceous.
on: On the Cheyenne river, ten or fifteen
s west of the mouth of Beaver creek, Black
.

iquata n. s. Conrad. (1860.)
Acad. Nat. Sci., Phila., vol 4, 2d ser., 1858-
, p. 278, pl. 46, fig. 2. Phila., 1858-1860. T.
onrad.
tion: Cretaceous.
on: Tippah county, Mississippi.

Dosinia—Continued.

—— pertenuis n. s. Gabb. (1864.)
Geol. Sur., Cal., Paleont., vol. 1, pp. 167, 168, pl. 30, fig. 253. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North side of Siskiyou mountains, in southern Oregon.

—— ? tenuis n. s. Meek. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 315. Phila., 1862. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— tenuis ? (Meek) Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873-1874, p. 264, pl. —, fig. 5. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island.

—— Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 8. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, N. C.

Dosiniopsis ? (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 179. Wash., 1876. F. B. Meek.

Dreissena (Van Beneden) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 328. Phila., 1855-1858. T. A. Conrad.

—— tippana n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 328, pl. 34, fig. 14. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Drepanocheilus n. subgen. Meek. (1864.)
Check List Invert. Foss. N. Am., Cat. and Jour. Smithson. Misc. Coll., vol. 7, No. 177, p. 35. Wash., 1864. F. B. Meek.

Dropanochilus subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 324. Wash., 1876. F. B. Meek.

Drillia (Gray) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 331. Phila., 1855-1558. T. A. Conrad.

—— ? distans. n. s. Conrad. (1860.)
Jour. Acad Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 286, pl. 46, fig. 49. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— georgiana n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 280, 281. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Clay county, Ga.

—— novemcostata n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 231, pl. 35, fig. 13. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, 3 miles north of the town of Ripley, Miss.

Drillia—Continued.

—— ? **tippana** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 331, pl. 35, fig. 5. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, 3 miles north of the town of Ripley, Miss.

Dysanomya (subgen. Ag.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Echinus (Lam.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.

—— **infulatus** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 131, pl. 10, fig. 7. New Haven, 1833. S. G. Morton.

Formation: Cretaceous [Tertiary].

Location: South Carolina.

—— **infulatus** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 75, pl. 10, fig. 7. Phila., 1834. S. G. Morton.

Formation: Cretaceous [Tertiary].

Location: South Carolina.

—— sp. undet. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 287. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: United States.

Edmondia (De Koninck) H. & W. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 283. Wash., 1877. Hall & Whitfield.

—— **myrina** n. s. H. & W. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 283, pl, 6, fig. 19. Wash., 1877. Hall & Whitfield.

Formation: Triassic.

Location: Dun glen, Pah-Ute range, Nev.

Egeta (subgen. H. & A. Ad.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 157. Wash., 1876. F. B. Meek.

Electroma (Stoliczka) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 29. Wash., 1876. F. B. Meek.

Ellipsosmilia (subgen. d'Orb.) Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, p. 208. Phila., 1864. W. M. Gabb.

Emarginula (Lam.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 140. Phila., 1864. W. M. Gabb.

—— **radiata** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 140, pl. 21, figs. 102, 102*a*. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Texas flat, Placer county, Cal.

Embudo sp. undet. Ramirez. (1880.)

An. Min. Fomento Rep. Mex., Tomo 3, p. 657, Lam. 1, fig. 12. Mexico, 1880. S. Ramirez.

Formation: Cretaceous.

Location: Sierra Mojada, Mexico.

Enallaster d'Orb. (1853.)

Paleont. Francaise, Echinoides Irreguliers, Terr. Cret. t. Sixieme, pp. 181–183. Paris, 1853–18 A. d'Orbigny.

—— (d'Orb.) Desor. (1858.)

Synop. Echinides Foss., p. 357. Paris and Wiesbade, 1858. E. Desor.

—— **mexicanus** n. s. Cotteau. (1890.)

Bull. Soc. Geol. France, 3d ser., vol. 18, pp. 2–298, pl. 2. Paris, 1890. Cotteau.

Formation. Cretaceous.

Location: Guadalupe, state of Chihuahua, and Colima, Mexico.

—— **texasnus** (Roemer sp.) d'Orb. (1853.)

Paleont. Francaise Echinoides Irreguliers, Terr. Cret. t. Sixieme, pp. 184–186, pl. 850. Paris, 1853–1850. A. d'Orbigny.

Formation: Cretaceous.

Location: Fredericksburg, Tex.

—— **texanus** (Roemer sp.) Desor. (1858.)

Synop. Echinides Foss., p. 358. Paris and Wiesbade, 1858. E. Desor.

Formation Cretaceous.

Location: Fredericksburg, Tex.

Enclimatoceras (Hyatt) White. (1884.)

Bull. U. S. Geol. Sur., No. 4, pp. 16, 17. Wash., 1884. C. A. White.

—— (Nautilus) **ulrichi** White. (1884.)

Bull U. S. Geol. Sur., No. 4, p. 17, pls. 7–9. Wash., 1884. C. A. White.

Formation: Cretaceous [Tertiary].

Location: Near Little Rock, Ark.

Encrinites and Bryozoa. (1854.)

Rep. Expl. and Sur. P. R. R., Mississippi River to Pacific Ocean, vol. 2; Rep. Expl. Forty-first Parallel N. Lat., p. 109, pl. 1, fig. 12. Wash., 185 James Schiel.

Formation: Cretaceous.

Location: Indian creek.

Endocostea n. g. Whitfield. (1877.)

U. S. Geog. and Geol. Sur. Rocky Mt. Region, Prelim. Rep. Paleont., Black Hills, pp. 31, 32. Wash., 1877. R. P. Whitfield.

—— **sulcata** (Roem.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 404, 40 pl. 10, fig. 6. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: Loose, on the east fork of Beaver creek, Black hills.

—— **typica** n. s. Whitfield. (1877.)

U. S. Geog. and Geol. Sur. Rocky Mt. Region, Prelim. Rep. Paleont., Black Hills, pp. 32, 33. Wash., 1877. R. P. Whitfield.

Formation: Cretaceous.

Location: Old Womans Fork of the Cheyenne river, Black hills, Dak.

—— —— Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 403, 404, pl. 9, figs. 1–7. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: Old Womans fork of the Cheyenne river, Black hills.

Endoptygma n. g. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 302. Phila., 1876. Wm. M. Gabb.

—— **umbilicata** (Tuomey sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 302, pl. 17, figs. 8 and 9. Phila., 1876. Wm. M. Gabb.
Formation: Cretaceous.
Location: Mississippi and Alabama.
(=Pholus umbilicata Tuomey.)

Entalis (Sow.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 267, 268. Wash., 1876. F. B. Meek.

—— **cooperi** (Gabb sp.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 138. pl. 16, figs. 10, 10*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island, two miles and a quarter up the Nanaimo river, and lower part of the Trent river, Vancouver island.

—— ? **paupercula** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 269, pl. 18, fig. 14. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— **paupercula** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 81. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Milk river, at the mouth of Pa-kow-ki coulee, Canada.

Entalaphora n. g. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–1863, p. 170. Phila., 1862, 1863. Gabb & Horn.

—— **conradi** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862–1863, p. 170 [pl. 21], fig. 59. Phila., 1862–1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

—— **quadrangularis** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 170, pl. 21, fig. 58. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, and probably near Mullica hill, N. J.

Entolium n. subgen. Meek. (1865.)
Geol. Sur. Cal. Geol., vol. 1, p. 478. Phila., 1865. F. B. Meek.

Epona (subgen. H. & A. Ad.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 164. Phila., 1869. W. M. Gabb.

Eripachya n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 148, 149. Phila., 1869. W. M. Gabb.

—— **hoffmannii** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 149. Phila., 1869. W. M. Gabb.

—— **perforata** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 149. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Cal.

—— **ponderosa** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 149. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan or Lick springs, Pence's ranch, Butte county, Cal.

Eriphyla n. g. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 180. Phila., 1864. W. M. Gabb.

—— **gregaria** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 124–126, pl. 17, figs. 9 *a–b*, figs. 6, 7, p. 124. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth.

—— **umbonata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 180, pl. 24, figs. 162, 162*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cow creek, Shasta county; Curry's, south side of Mount Diablo, Cal.

—— **umbonata** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 151, 152. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, two miles and a quarter up and at the Sucia islands.

Eschara (Lam.) Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 124. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

—— **digitata** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 79, pl. 13, fig. 8. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **digitata** (Mort.) Lonsdale. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, pp. 73–75, figs. *a* 9, p. 73. London, 1845. William Lonsdale.
Formation: Cretaceous.
Location: Timber creek, N. J.

—— **digitata** (Mort.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 114, 115. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek and near Mullica hill, N. J.

Eschara—Continued.

—— dichotoma (Goldf.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 218, 219. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Near Brownville, N. J.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location: Gloucester county, N. J.

—— sp. undet. Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 2. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Texas.

Escharina sagena (Mort. sp.) Lonsdale. (1844.)
Quart. Jour. Geol. Soc., London, vol 1, pp. 71, 72, figs. a–c, p. 71. London, 1845. William Lonsdale.
Formation: Cretaceous.
Location: Timber creek, N. J.

Escharinella muralis n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 140 [pl. 19], fig. 23. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

—— (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 140. Phila., 1862, 1863. Gabb & Horn.

Escharifora (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 134. Phila., 1862, 1863. Gabb & Horn.

—— typica (G. & H. sp.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 134, 155 [pl. 19], fig. 16. Phila., 1862, 1863. W. M. Gabb.
Formation: Cretaceous.
Location: Timber creek and Mullica hill, N. J.

Escharipora (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 148. Phila., 1862, 1863. Gabb & Horn.

—— abbottii n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 149 [pl. 20], fig. 33. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

—— distans n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 148, 149 [pl. 20], fig. 32. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, N. J.

Escharipora—Continued.

—— immersa n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 149, 150. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, N. J.

Estheria bellula n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 2, pp. 162, 163, pl. 21, figs. 7, 7a. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rink rapids, on the Lewes river, a tributary of the Yukon, lat. 60° 20'. long. 135° 20', Northwest Territory.

—— ovata (Lea) Jones. (1862.)
Paleontographical Society, pp. 84–99, pl. 2, figs. 26–28. London, 1862. T. R. Jones.
Formation: Triassic ?
Location: Blackheath, near Richmond, Va., Dan river and Chatham county, N. C., Phœnixville, Pa.

—— ovata (Lea. sp.) Jones. (1862.)
Quart. Jour. Geol. Soc., London, vol. 19, pp. 151-153. London, 1863. T. R. Jones.
Formation: Lower Mesozoic.
Location: North and South Carolina, Eastern Virginia, Pennsylvania.

Etea n.g. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Ken., App. A, pp. 5, 6. T. A. Conrad.

—— carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875. W. C. Ken., App. A, p. 6, pl. 1, fig. 14. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

Ethmocardium n. subgen. White. (1879.)
Proc. U. S. Nat. Mus., vol. 2, pt. 2, pp. 291, 293. Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.

Eudea (Lam.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 330. Phila., 1862. W. M. Gabb.

—— dichstoma n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 330. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Near Mullica hill, and at Blackwoodtown, N. J.

Eudiscoceras n.g. Hyatt. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 128. Wash., 1877. Alpheus Hyatt.

—— gabbi n. s. Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 128, 129, pl. 11, figs. 3, 3a. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Cottonwood canyon, West Humboldt range, Nev.

Eulima (Risso) Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 170. Phila., 1870. T. A. Conrad.

—— ? **chrysalis** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr. p. 506. Wash., 1872. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, near Coalville, Utah.

—— **funicula** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 506. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? **inconspicua** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 507. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, near Coalville, Utah.

—— ? **inconspicua** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr., Sur. Terr., pt. 1, p. 33, pl. 12, fig. 5a. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location : Carleton's coal mine, Coalville, Utah.

—— (?) **subfusiformis** n. s. Shumard. (1853.)
Expl. Red River Louisiana, by R. B. Marcy, p. 208, pl. 4, fig. 3. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Camp No. 4, Cross Timbers, Tex.

—— (?) **texana** n. s. Roemer. (1849.)
Tex., p. 413. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— (?) **texana** Roemer. (1852.)
Kreide von Tex., p. 40, Taf. 4, fig. 2. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

Eulimella (Forbes) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, p. 197. Wash., 1875. C. A. White.

—— ? **chrysalis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (?) **chrysalis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 32, 33, pl. 12, fig. 4a. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— **funicula** (Meek) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, p. 197, pl. 18, fig. 6a. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: North Fork of Virgin river, Utah.

Eulimella—Continued.

—— ? **funicula** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **funicula** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 316, 317, pl. 9, fig. 10a. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **inconspicua** (Meek) White., (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Eumicrotis n. g. Meek. (1864.)
Am. Jour. Sci., 2d ser., vol. 37, pp. 218, 219. New Haven, 1864. F. B. Meek.

—— **curta** (Hall) M. & H. (1865.)
Paleont., Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 182, p. 81. pl. 3, figs. 10. *a–d.* Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base Black hills.

—— **curta** (Hall) H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 289, pl. 7, fig. 24. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Ashley creek, Uinta range, Utah.

—— **curta** (?) (M. & H.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 403. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— **curta** (?) (M. & H.) Whiteaves. (1878.)
Geol. Sur. Can. Rep. Prog. for 1876–1877, pp. 152, 153. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

Euspira (Ag.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 160. Phila., 1869. W. M. Gabb.

—— **alveata** (Con. sp.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 160. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **coalvillensis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **coalvillensis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 310, pl. 4, figs. 2*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Euspira—Continued.

—— **tabulata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 260, pl. 32, fig. 4. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **utahensis** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 29. Wash., 1883. C. A. White.
(E. coalvillensis, Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 237, 253 and 310, by mistake.)

Eutomoceras n. g. Hyatt. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 126. Wash., 1877. Alpheus Hyatt.

—— **laubei** n. s. Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 126–128, pl. 10, figs. 8, 8*a*. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: New Pass, Desatoya mountains, Nev.

Exilifusus n. subgen. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 278, 279. Phila., 1876. W. M. Gabb.

Exogyra n. g. Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 43. New Haven, 1820. Thomas Say.

—— **arietina** n. s. Roemer. (1849.)
Texas, pp. 397, 398. Bonn, 1849. Roemer.
Formation: Cretaceous.
Location: Waco camp and Mission hills, near New Braunfels, springs of San Marcos river and Brazos river, above Torrey's trading house.

—— **arietina** Roemer. (1852.)
Kreide von Texas, p. 68, Taf. 8, figs. 10*a–e*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp above New Braunfels, Mission hills, springs of San Marcos river, upper Brazos, above Torrey's trading house, and near Austin, Tex.

—— **arietina** (Roem.) Conrad. (1854.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 153, pl. 7, figs. 1*a–e*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon springs.

—— **arietina** (Roem.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., pp. 303, 304, pl. 51, figs. 3–5. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

—— **aquila** (Gold.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 304, pl. 53, figs. 1, 2. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Bell county, Tex.

—— **auricularis** (Wahl.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 230, 231. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Near Woodbury, N. J.

Exogyra—Continued.

—— **caprina** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2 ser., 1850–1854, p. 273, pl. 24, figs. 3, 4. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: San Felipe creek, near Rio Grande, Western Tex.

—— **columbella** n. s. Meek. (1876.)
Rep. Expl. Exped. Santa Fe, N. Mex., to junction of Grand and Green rivers, pp. 124, 125, pl. 1, figs. 3*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Covero; Sierra Abajo; Galisteo, New Mexico.

—— **columbella** (Meek) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 304, pl. 55, figs. 5, 6. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Southern Utah and adjacent parts of New Mexico.

—— **costata** n. s. Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 43. New Haven, 1820. Thomas Say.
Formation: Cretaceous.
Location: New Jersey.

—— **costata** (Say) Morton. (1828.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 85–88, pl. 6, figs. 1–4. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Delaware; well near Eutaw springs, S. C.

—— **costata** (Say) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 284. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey to South Carolina.

—— **costata** (Say) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 55, 56, pl. 6, figs. 1–4. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey, Delaware, South Carolina, Alabama, Tennessee, and Arkansas.

—— **costata** (Say) Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: McNairy county, Tenn.

—— **costata** (Say) Roemer. (1849.)
Tex., p. 396. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Colorado river, near Austin, Tex.

—— **costata** (Say) Roemer. (*1852.*)
Kreide von Texas, p. 72. Bonn, 1852. *F. Roemer.*
Formation: Cretaceous.
Location: On the Colorado river, near Austin, Tex.

—— **costata** (Say) Conrad. (1854.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 154, 155, pl. 9, figs. 1, 2; pl. 10, fig. 1; pl. 8, fig. 3. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Eocene locality, Jacun, three miles below Laredo, Mexico.

gyra—Continued.

costata var. Conrad. (1857.)

ep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 154, pl. 8, fig. 2. Wash., 1859. T. A. Conrad.

ormation: Cretaceous.

ocation: Texas.

costata (Say) Emmons. (1858.)

ep. N. Carolina Geol. Sur., p. 278, fig. *A*. Raleigh, 1858. E. Emmons.

ormation: Cretaceous.

ocation: Black rock on the Cape Fear, and at Rocky point, twenty miles north of Wilmington, N. C.

costata (Say) Owen. (1860.)

cond Rep. Geol. Rec., Ark., pl. 7, fig. 4. Phila., 1860. D. D. Owen.

ormation: Cretaceous.

ocation: Arkansas.

costata (Say) Cook. (1868.)

nn. Rep. Geol. Sur. N. J., for 1868, p. 374, fig. —, p. 374. Newark, 1868. G. H. Cook.

ormation: Cretaceous.

ocation: New Jersey.

costata (Say) Gabb. (1876.)

roc. Acad. Nat. Sci., Phila., for 1876, p. 323. Phila., 1876. Wm. M. Gabb.

ormation: Cretaceous.

cation: Georgetown, and five miles north of Lumpkin, Stewart county, Ga.

costata (Say) White. (1884.)

urth Ann. Rep. U. S. Geol. Sur., p. 304, pl. 51, figs. 1, 2; pl. 57, figs. 1, 2. Wash., 1884. C. A. White.

rmation: Cretaceous.

costata (Say) Whitfield. (1885.)

ong. U. S. Geol. Sur., vol. 9, pp. 39–41, pl. 6, figs. 1, 2. Wash., 1885. R. P. Whitfield.

rmation: Cretaceous.

cation: Nearly all the localities of the lower marl beds of the Cretaceous in New Jersey.

costata var. fluminis n. var. White. 75.)

p. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 174, 175, pl. 17, figs. 3*a–d*. Wash., 1875. C. A. White.

rmation: Cretaceous.

cation: East bank of the Rio Puerco, six miles elow Casa Salazan, N. M.

imbriata n. s. Conrad. (1855.)

c. Acad. Nat. Sci., Phila., for 1854, 1855, p. 69. Phila., 1856. T. A. Conrad.

rmation: Cretaceous.

cation: Texas.

imbriata Conrad. (1857.)

p. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 54, pl. 7, figs. 2*a*, *b*. Wash., 1857. T. A. Conad.

rmation: Cretaceous.

ation: Western Texas.

imbriata (Con.) White. (1884.)

rth Ann. Rep. U. S. Geol. Sur., p. 305. Vash., 1884. C. A. White.

mation: Cretaceous.

Exogyra—Continued.

—— flabellata (Goldf.) Marcou. (1858.)

Geol. N. Am., pp. 41, 42. Zurich, 1858. Jules Marcou.

Formation: Cretaceous.

Location: Cross Timbers, Fort Arbuckle; headwaters of the Rio Colorado, Tex., and the vicinity of Fredericksburg and New Braunfels.

—— forniculata n. s. White. (1879.)

Proc. U. S. Nat. Mus., vol. 2, pt. 2, pp. 293, 294, pl. 4, fig. 384. Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.

Formation: Cretaceous.

Location: Bexar county, Tex.

—— forniculata White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pl. 14, figs. 2*a*, *b*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Bexar county, Tex.

—— forniculata White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 305, pl. 52, figs. 1, 2. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Texas.

—— fragosa n. s. Conrad. (1855.)

Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 269. Phila., 1856. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera [Tex.].

—— fragosa Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pl. 8, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera.

—— fragosa (Con.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 305. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Texas.

—— interrupta n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 330, pl. 34, fig. 15. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— interrupta (Con.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 305. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Mississippi.

—— laciniata (Goldf.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 229, 230. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Near Woodbury, N. J.

—— læviuscula n. s. Roemer. (1849.)

Tex., p. 398. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Crossing of the Cibolo between New Braunfels and San Antonio, Tex.

Exogyra—Continued.

—— **læviuscula Roemer. (1852.)**
Kreide von Tex., pp. 70, 71, Taf. 9, figs. 3*a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Crossing of the Cibolo between New Braunfels and San Antonio, Tex.

—— **læviuscula (Roem.) Conrad. (1857.)**
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 154, pl. 7, figs. 4*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon springs.

—— **læviuscula (Roem.) White. (1875.)**
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, pp. 173, 174, pl, 17, figs. 2*a–d*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Linear Plateau, Southeastern Utah.

—— **læviuscula (Roem.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., pp. 305, 306, pl. 52, figs. 3–5. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas and New Mexico.

—— **matheroniana (d'Orb.) Conrad. (1857.)**
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 154, pl. 8, figs. 1*a*, *b*, pl. 11, figs. 1*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between El Paso and Frontera.

—— **matheroniana (d'Orb.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 306. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

—— **parasitica n. s. Gabb. (1864.)**
Geol. Sur. Cal. Paleont., vol. 1, p. 205, pl. 26, figs. 192, 192*a*, *b*, pl. 31, figs. 273, 273*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, opposite Folsom; Cottonwood creek, Shasta county, Cal.

—— **parasitica (Gabb) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 306, pl. 55, figs. 3, 4. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: California.

—— **planospirites (Goldf.) Credner. (1870.)**
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 231. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **plicata (Lam. sp.) Gabb. (1869.)**
Geol. Sur., Cal. Paleont., vol. 2, p. 275, pl. 36, figs. 19, 19*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

Exogyra—Continued.

—— **plicata (Goldf.) Credner. (1870.)**
Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 228, 229. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Middletown, Nut swamp, Marlboro, N. J.

—— **plicata (Lam.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 306. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **ponderosa n. s. Roemer. (1849.)**
Texas, pp. 395, 396. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Many places near New Braunfels, especially in ravine on the road to Seguin, Tex.

—— **ponderosa Roemer. (1852.)**
Kreide von Tex., pp. 71, 72, Taf. 9, figs. 2*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, and ravine three miles from New Braunfels on road to Seguin, Tex.

—— **ponderosa (Roem.) Shumard. (1853.)**
Expl. Red River, Louisiana, by R. B. Marcy, p. 204. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Fort Washita, Ind. T.

—— **ponderosa (Roem.) Credner. (1870.)**
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 229. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Nut swamp, N. J.

—— **ponderosa (Roem.) White. (1875.)**
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, pp. 172, 173, pl. 14, figs. 1*a–c*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: East of Impracticable ridge, Utah.

—— **ponderosa (Roem.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 306, pl. 50, figs. 1–3. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Gulf States.

—— **texana n. s. Roemer. (1849.)**
Tex., pp. 396, 397. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Hills near Fredericksburg, San Saba river, near Waco camp, etc.

—— **texana Roemer. (1852.)**
Kreide von Tex., pp. 69, 70, Taf. 10, figs. 1*a–e*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, San Saba valley, on road from New Braunfels to Fredericksburg and near the Waco camp on the Guadelupe above New Braunfels.

—— **texana (Roem.) Shumard. (1853.)**
Expl. Red river, Louisiana, by R. B. Marcy, p. 205, pl. 5, figs. 1*a*, *b*. and fig. 5. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Camp No. 4, Cross timbers, Tex.

ogyra—Continued.

– texana (Roem.) Blake. (1855.)

Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol, 2; Rep. Geol. thirty-second parallel, p. 39. Wash., 1855. W. P. Blake.
Formation: Cretaceous.
Location: From the banks of Red river near Preston; from the Big springs of the Colorado.

– texana (Roem.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 306, pl. 51, figs. 1–5. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

– valkeri n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 278, pl. 1, figs. 1*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Salado, Bell county, Tex.

– walkeri White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 307, pl. 54, figs. 1, 2. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

– winchelli n. s. White. (1879.)

Proc. U. S. Nat. Mus., vol. 2, pt. 2, pp. 294, 295, pl. 2, figs. 1, 2, pl. 3, figs. 1, 2. Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Collin county, Tex.

– winchelli White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 12, pl. 13, figs. 1 *a–d*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Collin county, Tex.

– winchelli White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 307, pl. 55, figs. 6, 7; pl. 56, figs. 1, 2. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Gulf States.

– sp. undet. Troost. (1840.)

Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: McNairy county, Tenn.

– sp. undet. Roemer. (1852.)

Kreide von Tex., p. 72. Bonn., 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp on the Guadalupe above New Braunfels, Tex.

– sp. undet. Roemer. (1852.)

Kreide von Tex., p. 73. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, on the Guadalupe above New Braunfels, Tex.

– sp. undet. Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 175. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Entrance to Departure bay, Vancouver island.

Exogyra—Continued.

—— sp. undet. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 165. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devils lake, Northwest Territory.

Fasciolaria (Lam.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 390. Phila., 1858–1860. W. M. Gabb.

—— (Lam. typical) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 355. Wash., 1876. F. B. Meek.

—— buccinoides n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 67. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau and Fox hills, Nebr.

—— buccinoides (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 358, 359, pl. 31, figs. 8*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river and Long lake.

—— cretacea n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, pp. 66, 67. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river and Fox hills, Nebr.

—— ? io n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 101, 102, pl. 28, fig. 214. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

—— ? læviuscula n. s. Gabb. (1864.)

Geol. Sur. Cal., Paleont., vol. 1, pp. 100, 101, pl. 18, fig. 55. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Below coal in the Mount Diablo district, San Diego and Martinez; Bulls Head point, Hill mine, near Clayton, Cal.

—— ? nodulosa n. s. Whiteaves. (1874.)

Geol. Sur. Can.; Rep. Prog. for 1873–74, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and a quarter and two and a half miles up.

—— nodulosa Whiteaves. (1874.)

Geol. Sur. Can.; Rep. Prog. for 1873–74, p. 263. Montreal 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island.

—— nodulosa Whiteaves. (1874.)

Geol. Sur. Can.; Rep. Prog. for 1873–74, p. 268, pl. —, figs. 7, 7*a*, *b*. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and a quarter miles up; Protection island.

Fasciolaria—Continued.

—— **saffordi** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 390, pl. 68, fig. 6. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tenn.

—— **sinuata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 101, pl. 28, fig. 213*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon; San Diego, Cal.

—— **slackii** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 322. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **slackii** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 282. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **(Cryptorhytis) cheyennensis** (M. & H. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 365, 366, pl. 19, figs. 13*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: South fork of Cheyenne river, near the Black hills.

—— **(Cryptorhytis) contorta** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 422, 423, pl. 12, fig. 10. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman fork of the Cheyenne river, Wyo.

—— **(Cryptorhytis) crassicosta** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 282, 283. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— **(Cryptorhytis) flexicostata** (M. & H. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 367, 368, pl. 19, fig. 2, and fig. 46 p. 367. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from its mouth.

—— **(Cryptorhytis) fusiformis** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 421, 422, pl. 12, fig. 12. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek, Black hills.

—— **(Cryptorhytis) kerri** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 283. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: North Carolina.

Fasciolaria—Continued.

—— **(Cryptorhytis) obliquicostata** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 283, 284 Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: North Carolina.

—— **(Mesorhytis) gracilenta** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 364, 365, fig. 45, p. 364. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from its mouth.

—— **(Piestocheilus) alleni** n. s. White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 34, 35, pl. 12, fig. 1*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Yellowstone river, Mont.

—— **(Piestocheilus) cretacea** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 363, 364, pl. 31, figs. 11*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— **(Piestocheilus) culbertsoni** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 360–362, pl. 32, fig. 1*a*–*f*, and fig. 44, p. 360. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— **(Piestocheilus) culbertsoni** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 185. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of Saint Vrains creek, and also in the valley of the Cache à la Poudre, Colo.

—— **(Piestocheilus) culbertsoni** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 423, 424, pl. 12, fig. 11. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Near French creek, Black hills.

—— **(Piestocheilus)? galpiniana** (M. & H. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 362, 363, pl. 32, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— **(Piestocheilus) scarboroughi** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 359, 360, pl. 32, figs. 4*a*–*d*. Wash , 1876. F. B. Meek.
Formation: Cretaceous.
Location: Butte au Grès, on the Missouri river.

iolaria—Continued.

sp. undet. Hill. (1889.)
ol. Sur. Tex., Bull. No. 4, p. 19. Austin, 1889.
R. T. Hill.
rmation: Cretaceous.
cation: North of Webberville, Tex.

ipora (d'Orb.) G. & H. (1862.)
ur. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 165. Phila., 1862, 1863. Gabb & Horn

americana n. s. G. & H. (1862.)
ur. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 165, 166, pl. 21, fig. 54. Phila., 1862, 1863. Gabb & Horn.
rmation: Cretaceous.
cation: Mullica hill and Timber creek, N. J.

asia n. g. d'Orb. (1855.)
leont. Francaise, Echinoides Irreguliers, Terr. Cret., 1 Sixieme, pp. 314, 315. Paris, 1853–1860. A. D'Orbigny.

(d'Orb.) Desor. (1858.)
nop. Echinoides Foss., pp. 316, 317. Paris & Wiesbade, 1858. E. Desor.

florealis (Mort. sp.) d'Orb. (1855.)
leont. Francaise, Echinoides Irreguliers, Terr. Cret., 1, Sixieme, pp. 319, 320, pl. 920, figs. 5, 6. Paris, 1853–1860. A. d'Orbigny.
rmation: Cretaceous.
cation: Delaware and Chesapeake canal.

florealis (Mort. sp.) Desor. (1858.)
nop. Echinoides Foss, p. 318. Paris & Wiesbade, 1858. E. Desor.
rmation: Cretaceous.
cation: Chesapeake canal, Del.

us (Montfort.) White. (1889.)
ll. U. S. Geol. Sur. No. 51, p. 20. Wash., 1889. C. A. White.

marcidulus n. s. White. (1889.)
ll. U. S. Geol. Sur., No. 51, pp. 20, 21, pl. 4, figs. 12, 13. Wash., 1889. C. A. White.
rmation: Cretaceous.
cation: Butte county, Cal.

psis (Con.) Gabb. (1869.)
ol. Sur. Cal. Paleont, vol. 2, p. 158. Phila., 1869. W. M. Gabb.

cooperii Gabb. (1869.)
ol. Sur. Cal. Paleont, vol. 2, p. 159. Phila., 1869. W. M. Gabb.
rmation: Cretaceous.
cation: California.

hornii Gabb. (1869.)
ol. Sur. Cal. Paleont, vol. 2, p. 158. Phila., 1869. W. M. Gabb.
rmation: Cretaceous.
cation: California.

remondii Gabb. (1869.)
ol. Sur. Cal. Paleont, vol. 2, p. 158. Phila., 1869. W. M. Gabb.
rmation: Cretaceous.
cation: California.

Ficus (Klein) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332. Phila., 1855–1858. T. A. Conrad.

——? cypræoides n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont, vol. 1, p. 105, pl. 19, fig. 58. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

——octoliratus n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332, pl. 35, fig. 6. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

——(Pyrifusus) granosus n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 196. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point, Navarro county, Tex.

Filifascigera (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 165. Phila., 1862, 1863. Gabb & Horn.

—— megæra (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 165, pl. 21, figs. 53. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, N. J.

Flabellina cordata (Reuss) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 214. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville, N. J.

Flabellum (Lesson) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 399. Phila., 1858–1860. W. M. Gabb.

—— remondianum n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 207, pl. 26, fig. 199. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Between Mount Diablo and the coal mines, Cal.

—— striatum (G. & H.) Gabb. (1860.)
Jour. Acad. Nat. Sci. Phila., vol. 4, 2d ser., 1858–1860, p. 399, pl. 69, figs. 10, 11. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

Flustra (Lam.) Morton. (1829.)
Jour. Acad. Nat. Sci. Phila., vol. 6, 1st ser., 1827–1831, p. 24. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

—— sagena n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 79, pl. 13, fig. 7. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Flustra—Continued.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st. ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester county, N. J.

Flustrella G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 160. Phila., 1862, 1863. Gabb & Horn.

—— **capistrata** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 161, pl. 20, fig. 48. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

—— **cylindrica** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 161 [pl. 20], fig. 49. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

Fragum (Bolton) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 139. Wash., 1885. R. P. Whitfield.

—— **tenuistriatum** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 139, 140, pl. 20, fig. 15. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Rev. G.C. Schauck's pits, Marlboro, N. J.

Frondicularia? strophoconus Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 29. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Fulgur (Montfort) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 22. Wash., 1889. C. A. White.

—— **hilgardi** n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 22, 23, pl. 3, figs. 2 and 3. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Penco's ranch, Butte county, Cal.

Fulguraria (Schumacker) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 23. Wash., 1889. C. A. White.

—— **gabbi** n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 23–25, pl. 3, fig. 1. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Centerville, Butte county, Cal.

—— **gabbi** White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 46, 47. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia and Sheep Jack islands.

Fulguraria—Continued.

—— **navarroensis** (Shum. sp.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 117–119, pl. 15, figs. 3, 3a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: West side of Hornby island; Blunden point; Browns river, Vancouver island; Sucia islands.

Fulvia (Grey) Whitfield. (1884.).
Mong. U. S. Geol. Sur., vol. 9, p. 139. Wash., 1885. R. P. Whitfield.

—— **tenuis** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 139, pl. 20, fig. 8. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, Monmouth county, N. J.

Fusus (Klein) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855, 1858, p. 332. Phila., 1855, 1858. T. A. Conrad.

—— **sp.** Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 237. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **(Brug. typical).** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 373. Wash., 1876. F. B. Meek.

—— **aratus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 84, pl. 28, fig. 202. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

—— **averillii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 83, 84, pl. 18, fig. 34. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

—— **bellaliratus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332, pl. 35, fig. 17. Phila., 1855, 1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **californicus** (Con.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 85, 86, pl. 28, figs. 205, 205a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Clayton; Cochran's, near Mount Diablo; Alizos creek, near Fort Tejon, Cal.

—— **cheyennensis** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur., Rocky Mountain region: Prelim. Rep. Paleont Black hills, p. 37. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek, Black hills, Dak.

—Continued.

eyennensis Whitfield. (1880.)
Geol. Black Hills of Dak., pp. 424,425, pl. 12,
9. Wash., 1880. R. P. Whitfield.
ation : Cretaceous.
ion : On the Cheyenne river, near Rapid
ek, Black hills.

nstrictus n. s. H. & M. (1854.)
Am. Acad. Arts and Sci., vol. 5, n. s. pp.
392, pl. 3, figs. 7a-d. Cambridge and Bos-
, 1855. Hall & Meek.
ation : Cretaceous.
ion : Sage creek.

ntortus n. s. M. & H. (1856.)
Acad. Nat. Sci., Phila., for 1856, p. 65.
la., 1857. Meek & Hayden.
ation : Cretaceous.
ion : Moreau trading post, Nebr.

lbertsoni n. s. M. & H. (1856.)
Acad. Nat. Sci., Phila., for 1856, p. 66.
la., 1857. Meek & Hayden.
ation : Cretaceous.
ion : Moreau trading post, Nebr.

kotaensis n. s. M. & H. (1856.)
Acad. Nat. Sci., Phila., for 1856, p. 65.
la., 1857. Meek & Hayden.
ation : Cretaceous.
ion : Moreau trading post, Nebr.

boli n. s. Gabb. (1864.)
Sur. Cal. Paleont., vol. 1, p. 84, pl. 18, fig. 35.
la., 1864. W. M. Gabb.
tion : Cretaceous.
on : Cochran's, east of Mount Diablo ; near
ton, Cal.

xuocastatus n. s. M. & H. (1856.)
Acad. Nat. Sci., Phila., for 1856, p. 66.
a., 1857. Meek & Hayden.
tion : Cretaceous.
on : Moreau river, Nebr.

uosus n. s. Gabb. (1864.)
Sur. Cal. Paleont., vol. 1, p. 85, pl. 21, fig.
Phila., 1864. W. M. Gabb.
tion : Cretaceous.
on : Near Martinez.

pinianus n. s. M. & H. (1856.)
Acad. Nat. Sci., Phila., for 1856, p. 65,
a., 1857. Meek & Hayden.
tion : Cretaceous.
on : Moreau trading post, Nebr.

deni n. s. E. & S. (1857.)
Acad. Sci., St. Louis, vol. 1, 1856–1860, p.
St. Louis, 1856–1860. Evans & Shumard.
tion : Cretaceous.
on : Moreau river.

mesianus n. s. Gabb. (1860.)
Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–
p. 389, pl. 68, fig. 4. Phila., 1858–1860.
I. Gabb.
tion : Cretaceous.
on : Eufaula, Ala.

Fusus—Continued.

—— **intertextus** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 139.
Phila., 1858. Meek & Hayden.
Formation : Cretaceous.
Location : Yellowstone river, one hundred and fifty miles above its mouth, Nebr.

—— **kingii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 85, pl. 28, fig. 204. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location : Cottonwood creek, Siskiyou county, north of Yreka, Cal.

—— **kingii** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 119, pl. 15, fig. 4. Montreal, 1879. J. F. Whiteaves.
Formation : Cretaceous.
Location : Sucia islands.

—— **kingii** (Gabb) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 46. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sheep Jack island.

—— **martinez** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 82, 83, pl. 18, fig. 32. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location: Bulls Head point, northeast of Martinez.

—— **mathewsonii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 83, pl. 18, fig. 33. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez; Clayton; Cochran's, six miles east of Mount Diablo; Curry's, south side of Mount Diablo, Cal.

—— **mexicanus** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 259, pl. 35, fig. 2. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **newberryi** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 66. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river and Fox hills, Nebr.

—— **nebrascensis** n. s. E. & S. (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 41. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Sage creek, Mauvaises, Tenn.

—— **novemliratus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332, pl. 35, fig. 18. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **occidentalis** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 126, pl. 26, fig. 23. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Fusus—Continued.

—— **(?) pedernalis** n. s. Roemer. (1849.)
Texas, pp. 414, 415. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **pedernalis** Roemer. (1852.)
Kreide von Tex., p. 38, Taf. 4, figs. 13*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **retifer** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila, vol. 4, 2d ser., 1858-1860, p. 301, pl. 48, fig. 11. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, N. J.

—— **shumardii** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 391, pl. 3, figs. 6*a*, *c*. Cambridge & Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri.

—— **shumardi** (H. & M.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dakota, p. 424, pl. 12, figs., 7, 8. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: East fork of Beaver creek, Black hills.

—— **subtunitus** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 139. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Near Grand river, Nebr.

—— **(?) tenuilineata** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 392, pl. 3, figs. 8*a*-*c* and 9*a*-*c*. Cambridge & Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek.

—— **tippana** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 286, pl. 46, fig. 41. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— **trivolvus** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860 p. 94, pl. 2, fig. 5. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Timber creek, N. J.

—— **tumidus** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 145, 146, pl. 26, fig. 22. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **? utahensis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur., Terr., pt. 1, p. 34, pl. 12, fig. 2*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah, from "Chalk hill."

Fusus—Continued.

—— **vaughani** n. s. (M. & H.) (1875.)
Proc. Acad. Nat. Sci., Phila., for 1857, pp. 138, 139. Phila., 1858. Meek & Hayden.
Formation: Junction of upper Cretaceous and Tertiary beds. [Cretaceous.]
Location: Near mouth of Heart river, Nebr.

—— **(Exilifusus) kerri** n. s. Gabb. 1876.
Proc. Acad. Nat. Sci. Phila., for 1876, p. 279, pl. 17, fig. 1. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: North Carolina.

—— **(Hemifusus) cooperii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. pp. 86, 87, pl. 28, fig. 207. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: San Diego, and Cochran's, east of Mount Diablo, Cal.

—— **(Hemifusus) hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 86, pl. 28, figs. 206, 206*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

—— **(Hemifusus) remondii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 87, pl. 18, fig. 36. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cochran's, east of Mount Diablo; Bulls head point, northeast of Martinez; Aliso creek, near Fort Tejon, Cal.

—— **(Neptunea ?) gabbi** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 504, 505. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Neptunea ?) gabbi** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Neptunea ?) gabbi** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 317, pl. 9, fig. 9*a*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Neptunea ?) utahensis** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 505. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah; from "Chalk hill."

us—Continued.

(**Neptunea**) **utahensis** (Meek) 'hite. (1879.)
:leventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
'ormation: Cretaceous.
ocation: Coalville, Utah.

(**Pleurotoma** ?) **scarboroughi** n. s. [. & H.) (1857.)
roc. Acad. Nat. Sci., Phila., for 1857, pp. 139, 140. Phila., 1858. Meek & Hayden.
ormation: Cretaceous.
ocation: Butte aux Grès, on the Missouri river, Nebr.

(**Serrifusus**) **dakotensis** (M. & H.) ek. (1876.)
ep. U. S. Geol. Sur. Terr., vol. 9, pp. 374, 375, pl. 31, fig. 11 and pl. 32, figs. 6*a*, *b*. Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: Long lake and Moreau river, Dak.

? (**Serrifusus**) **dakotensis** n. var. ek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, pp. 375–377, pl. 32, fig. 7*a* (and 7, *b*?) Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: Moreau river, Dak.

sp. undet. Owen. (1860.)
cond Rep. Geol. Rec. Arkansas, pl. 8, fig. 4. Phila., 1860. D. D. Owen.
rmation: Cretaceous.
cation: Arkansas.

us (Rang.) Conrad. (1869.)
. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 01, Phila., 1870. . T. A. Conrad.

obrutus n. s. Conrad. (1869.)
. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 101, l. 9, fig. 18. Phila., 1870. T. A. Conrad.
rmation: Cretaceous.
ation: Haddonfield, N. J.

xias (subgen. Beck.) Meek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, p. 549. Wash., 876. F. B. Meek.

ites (**Descoidea**) sp. nov. Hill. 9.)
l. Sur. Tex. Bull. No. 4, p. 2. Austin 1889. . T. Hill.
mation: Cretaceous.
ation: Sierra Blanca district, Tex.

us (Humph.) Gabb. (1864.)
l. Sur. Cal. Paleont., vol. 1, p. 136. Phila., 864. W. M. Gabb.

xcentricus n. s. Gabb. (1864.)
l. Sur. Cal. Paleont., vol. 1, p. 136, pl. 20, fig. 5; pl. 29, fig 232*a*. Phila., 1864. W. M. Gabb.
mation: Cretaceous.
ation: Northeast of Martinez; Clayton; seven iles south of Martinez; San Diego; near Fort ejon, Cal.

Gari (Shum.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 155. Phila., 1864. W. M. Gabb.

—— **elliptica** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 307, 308. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— ? **texta** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 155, pl. 22, fig. 130. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

Gastrochæna (Spengl.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858–1860, p. 393. Phila., 1858–1860. W. M. Gabb.

—— **americana** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci. Phila., vol. 4, 2d ser., 1858–1860. p. 393, pl. 68, fig. 20. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Timber creek and Burlington county, N. J.

—— **americana** (Gabb) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 203, 204, pl. 26, figs. 17, 18. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Timber creek, N. J.

—— **tibialis** (Mort. sp.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 236, 237. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

Gemma ? (Deshayes) Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 96. Phila., 1870. T. A. Conrad.

—— **cretacea** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 96, 97, pl. 9, fig. 19. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county ?, Miss.

Genota (subgen. H. & A. Ad.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 382. Wash., 1876. F. B. Meek.

Gervillia (Defrance) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 328. Phila., 1855–1858. T. A. Conrad.

—— **ensiformis** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci. Phila., vol. 3, 2d. ser., 1855–1858, pp. 328, 329, pl. 34, fig. 10. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **gregaria** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 606, 607. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar county, Tex.

Gervillia—Continued.

—— **gregaria** (Shumard) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 38, pl. 18, fig. 3*a*. Wash., 1883. C. A. White.

—— **montanaensis** (Meek) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 145, pl. 37, fig. 1, *b*, *a*. Wash., 1883. C. A. White.

Formation: Jurassic.

Location: Near the lower canyon of Yellowstone river, Mont.

—— **mudgeana** n. s. White. (1879.)

Proc. U. S. Nat. Mus., vol. 2, pt. 2, pp. 295, 296, pl. 5, figs. 3 and 4, Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.

Formation: Cretaceous.

Location: Saline county, Kans.

—— **mudgeana** White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 16, 17, pl. 14, figs. 3*a*, *b*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Saline county, Kans.

—— **recta** n. s. (M. & H.) (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 441. Phila., 1862. Meek & Hayden.

Formation: Cretaceous.

Location: Deer creek, near north branch Platte river, Nebr.

—— **recta** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 66, 67, pl. 29, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Deer creek, near North Platte.

—— **recta** (Meek) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 358, 359, pl. 4, fig. 3. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: Near Sun Dance hills, Black hills.

—— **recta** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 35. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Bulls Head, about twenty-two miles west of the west end of the Cypress hills, Canada.

—— **recta** var. **borealis** n. var. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 35, 36, pl. 4, figs. 2, 2*a*, *b*. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Belly river, west of the mouth of the St. Mary river; Belly river, near the mouth of the St. Mary river; St. Mary river, near the Police Fort; South Saskatchewan, opposite Swift Current creek; Lone crossing of the Red Deer river, township 35, range 16, west of fourth principal meridian; Berry creek, section 31, township 25, range 12, west of fourth principal meridian, Canada.

Gervillia—Continued.

—— **recta** var. **borealis** Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 175. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Sounding creek, township 30, range 8, west of the fourth principal meridian, Northwest Territory.

—— **solenoides** (Defr.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 232, 233. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Woodbury, N. J.

—— **sparsalirata** n. s. Whitfield. (1876.)

Rep. Rec. Carroll, Mont., to Yellowstone and National park, p. 142, pl. 2, fig. 8. Wash., 1876. R. P. Whitfield.

Formation: Jurassic.

Location: Bridges mountains, Mont.

—— **subtortuosa** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 276. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Three hundred miles above Fort Union, on the Missouri, Nebr.

—— **subtortuosa** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 65, 66, pl. 16, figs. 7*a*–*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Three hundred miles above Fort Union, on the Missouri river.

Gervilliopsis n. g. Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 73. Wash., 1885. R. P. Whitfield.

—— **ensiformis** (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 73, 74, pl. 15, figs. 8–11; pl. 16, fig. 5. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Woodbury, Gloucester county, N. J.

—— **minima** n. s. Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 74, 75, pl. 15, fig. 7. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Freehold, N. J.

Globiconcha (d'Orb.) Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 319. Phila., 1862. W. M. Gabb.

—— **coniformis** n. s. Roemer. (1849.)

Tex., p. 411. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Upper course of Pedernales river, Tex.

—— **coniformis** Roemer. (1852.)

Kreide von Tex., p. 42, Taf. 4, figs. 5, *a*, *b*. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: On the upper course of Pedernales river, Tex.

Globiconcha—Continued.

—— **curta** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861. p. 319. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Comanche peak, Tex.

—— **(?) elevata** n. s. Shumard. (1853.)
Expl. Red river, Louisiana, by R. B. Marcy, p. 208, pl. 4, fig. 4. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Tex.

—— **planata** n. s. Roemer. (1849.)
Tex., p. 411. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, above New Braunfels, Tex.

—— **planata** Roemer. (1852.)
Kreide von Tex., pp. 42, 43, Taf. 4, figs. 6, *a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, on the Guadalupe, sixteen miles above New Braunfels, Tex.

—— **(Phasianella ?) remondii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 114, pl. 19, fig. 69. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Two miles north of Benicia, Cal.

—— **(Tylostoma) tumida** n. s. Shumard. (1853.)
Expl. Red River, La., by R. B. Marcy, p. 208, pl. 5, fig. 3. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Tex.

—— **?** n. s. Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 20. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: [Shoal Creek], Tex.

Glycimeris (Lam.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 248, 249. Wash., 1876. F. B. Meek.

—— **berthoudi** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fossil ridge, Colo.

—— **berthoudi** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 299, 300, pl. 6, figs. 1*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: About fifteen miles west of Greeley and about six miles south of Fort Collins, Colo.

—— **? dalli** n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 66, 67, pl. 14, figs. 7–9. Wash., 1889. C. A. White.
Formation: Jurassic.
Location: Kialagvic bay, Alaska.

Glycimeris—Continued.

—— **occidentalis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 250, pl. 30, figs. 9, *a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, on the Missouri.

Gnathodon (——) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 27. Wash., 1885. R. P. Whitfield.

—— **? tenuidens** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 27, 28, pl. 2, figs. 7–10. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Sayre's and Fisher's brickyards, and at R. N. and H. Valentine's, near Woodbridge, N. J.

Goniaster mammillata n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci. Phila., for 1876, pp. 178, 179, pl. 5, figs. 2, 2*a*, *b*. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Neighborhood of Vincenttown, N. J.

Goniatites (De Haan) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 21. Phila., 1864. W. M. Gabb.

—— **lævidorsatus** (Hauer sp.) Gabb. (1864.)
Geol. Sur. Cal. Paloont, vol. 1, pp. 21, 22, pl. 3, figs. 6, 7. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Opposite the military station in Owen's valley, Tulare county, Cal., about thirteen miles north of Owen's lake.

Goniobasis (Lea) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 560, 561. Wash., 1876. F. B. Meek.

—— **arcta** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 244. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Mellis station, Wyo.

—— **chrysallis** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 316. Wash., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Bear river, near Sulphur creek, Utah.

—— **chrysallis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **chrysallis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 91, 92, pl. 30, figs. 6*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, Bear river valley, Wyo.

Goniobasis—Continued.

—— **chrysallis (Meek) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 56, pl. 6, figs. 13, 14. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— **chrysalloidea n. s. White. (1876.)**
Rep. Geol. Uinta Mts., 123. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, near Mellis station, Wyo.

—— **chrysalloidea White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **chrysalloidea White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 92, pl. 30, figs. 6*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, Bear river valley, Wyo.

—— **chrysalloidea White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 92, pl. 30, figs. 6*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, Bear river valley, Wyo.

—— **chrysalloidea White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 56, pl. 6, figs. 10, 11. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— **cleburni n. s. White. (1876.)**
Rep. Geol. Uinta Mts., pp. 122, 123. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, near Mellis station, Wyo.

—— **cleburni White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 244, 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **cleburni White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 91, pl. 30, figs. 4*a*–*d*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, Bear river valley, Wyo.

—— **cleburni White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 56, pl. 6, figs. 7–9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

Goniobasis—Continued.

—— **convexa (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 562, 563, pl. 42, figs. 2*a*, *b*, fig. 71, p. 562, fig. 72, p. 563. Wash., 1876. F. B. Meek.
Formation: Probably Cretaceous.
Location: At the mouth of Judith river, Mont.

—— **convexa (M. & H.) White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 94. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Judith river, Mont.

—— **convexa (M. & H.) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, figs. 6, 7. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **convexa var. impressa (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 563, 564, pl. 42, figs. 2*c*, *d*. Wash., 1876. F. B. Meek.
Formation: Probably Cretaceous.
Location: Mouth of Judith river, Mont.

—— **convexa var. impressa (M. & H.) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, figs. 8, 9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: [Upper Missouri river region?]

—— **endlichi n. s. White. (1878.)**
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 716. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Seven miles west of Evanston, Wyo.

—— **endlichi White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Seven miles northward from Evanston, Wyo.

—— **endlichi White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 92, 93, pl. 30, figs. 7*a*–*c*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Seven miles northward from Evanston, on the Bear river valley [Wyoming].

—— **endlichi White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 7, figs. 7–9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— **gracilenta n. s. Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 568, 569, pl. 42, fig. 3, fig. 74, p. 569. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

obasis—Continued.

gracilenta (M. & H.) White. (1879.)
eventh Ann. Rep. U. S. Geol. and Geogr. Sur. Ferr., p. 220 Wash., 1879. C. A. White.
rmation: Cretaceous.
cation: Black buttes station, Wyo.

gracilenta (M. & H.) White. (1879.)
eventh Ann. Rep. U. S. Geol. and Geogr. Sur. Ferr., p. 171. Wash., 1879. C. A. White.
rmation: Cretaceous.
cation: Crow creek valley, Colo.

gracilenta (Meek) White. (1883.)
ird Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, igs. 12, 13. Wash., 1883. C. A. White.
rmation: Cretaceous.
ation: Crow creek valley, northern Colorado, ast of the Rocky mountains; Black buttes, Vyo.

racilenta (M. & H.) White. (1883.)
elfth Ann. Rep. U. S. Geol. and Geogr. Sur. 'err., pt. 1, p. 94. Wash., 1883. C. A. White.
mation: Cretaceous.
ation: Upper Missouri river region.

insculpta n. s. Meek. (1873.)
th Ann. Rep. U. S. Geol. and Geogr. Sur. 'err., pp. 515, 516. Wash., 1873. F. B. Meek.
mation: Cretaceous.
ation: Rock springs, Wyo.

nvenusta (M. & H.) Meek. (1876.)
. U. S. Geol. Sur. Terr., vol. 9, pp. 564, 565, l. 42, figs. 1*a–e*. Wash., 1876. F. B. Meek.
mation: Probably Cretaceous.
ation: Mouth of Judith river, Mont.

venusta (M. & H.) White. (1883.)
elfth Ann. Rep. U. S. Geol. and Geogr. Sur. err., pt. 1, p. 94. Wash., 1883. C. A. White.
mation: Cretaceous.
ation: Near the mouth of Judith river, Mont.

nvenusta (M. & H.) White. 3.)
rd Ann. Rep. U. S. Geol. Sur., p. 57, pl. 17, g. 17. Wash., 1883. C. A. White.
mation: Cretaceous.
ation: Upper Missouri river region.

omitta (M. & H.) Meek. (1876.)
. U. S. Geol. Sur. Terr., vol. 9, p. 568, pl. 42, gs. 4*a–c*. Wash., 1876. F. B. Meek.
nation: Cretaceous.
ation: Mouth of Judith river, Mont.

omitta (M. & H.) White. (1883.)
lfth Ann. Rep. U. S. Geol. and Geogr. Sur. err., pt. 1, p. 94. Wash., 1883. C. A. White.
nation: Cretaceous.
ation: Near the mouth of Judith river, Mont.

omitta (M. & H.) White. (1883.)
d Ann. Rep. U. S. Geol. Sur., p. 57; pl. 26, g. 10. Wash., 1883. C. A. White.
nation: Cretaceous.
ation: Upper Missouri river region.

Goniobasis—Continued.

—— macilenta White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 93, pl. 30, fig. 10*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, valley of Bear river, Wyo.

—— macilenta White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 56, pl. 6, fig. 12. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— nebrascensis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 565, 566, pl. 43, figs. 12*a–h*, fig. 73, p. 565. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fort Clarke, and at mouth of Yellowstone river.

—— nebrascensis (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 171. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colo.

—— nebrascensis (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 94. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— nebrascensis (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, figs. 15, 16. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Wales, Utah.

—— nebrascensis (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 21, 22, pl. 3, figs. 4, 4*a*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: North or second branch of the Milk river; Old Man river, two miles above Rye-Grass flat, and St. Mary river, three miles north of the forty-ninth parallel, Canada.

—— sublævis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 567, pl. 42; figs. 5*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— sublævis (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 94. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Judith river, Mont.

Goniobasis—Continued.

—— **sublævis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, fig. 18. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— ? **subtortuosa** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 569, 570, pl. 42, figs. 17*a*, *b*, figs. 75, 76, p. 569. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river.

—— ? **subtortuosa** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 27, fig. 34. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— ? **subtortuosa** (M. & H.) White. (883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1. p. 94. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Judith river, Mont.

—— **subtortuosa** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1. pp. 74, 75, pl. 10, fig. 7. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, two miles above Woodpecker island, and Belly river, east side of Driftwood bend; South Saskatchewan, one mile above the mouth of the Bow river, Canada.

—— **tenuicarinata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 566, 567, pl. 43, figs. 14*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Fort Union, Mont.

—— **tenuicarinata** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 94. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **tenuicarinata** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 57, pl. 26, fig. 11. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Wales, Utah; Cross creek valley; Northern Colorado, east of the Rocky mountains.

—— **tenuicarinata** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 22, pl. 3, figs. 5, 5*a*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bow river, two miles below the mouth of Jumping Pound river, Canada.

Goniobasis—Continued.

—— **tenuicarinata** (M. & H.) Whiteave (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Pa- ont., vol. 1, pt. 1, p. 27. Montreal, 1885. J F. Whiteaves.
Formation: Cretaceous.
Location: Pyramid creek, Canada.

—— **tenuicarinata** (M. & H.) **var.** Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 22, 23, pl. 3, figs. 6, 6a. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Two miles above Rye-Grass flat an twelve miles below Fort MacLeod on the Ol- Man river; Gooseberry canyon on the St. Ma- river; Pincher creek, Canada.

Goniochasma n. g. Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 34 Wash., 1864. F. B. Meek.
Type: Xylophaga stimpsoni (M. & H.) Meek.

—— **subgen.** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 255. Wash. 1876. F. B. Meek.

—— **stimpsoni** (M. & H.) Meek. (1864.
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 34 Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Dakota.

Goniomya (Agas.) Gabb. (1869).
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 1 Phila., 1870. W. M. Gabb.

—— **americana** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 81, 82 Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Monroe trading post, Nebr.

—— **americana** (M. & H.) Meek. (1876.
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 221, 22 pl. 30, figs. 12*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Dak.

—— **aperta** n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 11, pl. 6, fig. 8, Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Volcano about thirty miles southeast of Walkers lake, Nev.

—— **borealis** Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, pp. 362, 363, pl. 2. fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— **montanaensis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur Terr., pt. 1, p. 151, pl. 38, fig. 8*a*. Wash., 188 C. A. White.
Formation: Jurassic.
Location: Near the lower canyon of the Yellowstone river, Mont.

Goniomya—Continued.

—— Whiteaves. (1882.)
Proc. and Trans. Roy. Soc. Can., vol. 1, sec. 4, p. 83. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northeast slope of Jackass mountain, in the valley of the Lower Fraser, Canada.

—— **sp. undet.** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 225. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay.

Goniosoma n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 43, 44. Phila., 1870. T. A. Conrad.

—— **inflata** n. s. Conrad.. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 44, pl. 1, fig. 10. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, N. J.

Gouldia [Adams] Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 48. Phila., 1870. T. A. Conrad.

—— **conradi** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 125, 126, pl. 18, figs. 1–3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **declivis** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pl. 9, fig. 5. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **declivis** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 126, pl. 18, fig. 11. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **decemnaria** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 48, pl. 9, fig. 4. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **decemnaria** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 124, 125, pl. 18, fig. 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **parilis** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 126, 127, pl. 18, figs. 12, 13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Marlboro, N. J.

Grammatodon n. g. M. & H. (1865.)
Paleont. Up. Mo., Smithson. Cont. Knowl., vol. 14, No. 172, pp. 89, 90. Wash., 1865. Meek & Hayden.
Type: Arca (cucullaea) inornata M. & H.

Grammatodon—Continued.

—— (?) **iltasyoucoensis** n. s. Whiteaves. (1878.)
Canadian Naturalist, vol. 8., n. ser., No. 7, p. 404. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— (?) **iltasyoucoensis** Whiteaves. (1878.)
Geol. Sur. Can.; Rep. Prog. for 1876, 1877, pp. 153, 154. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— **inornatus** M. & H. (1865.)
Paleont. Up. Mo., Smithson. Cont. Knowl., vol. 14, No. 172, p. 90, pl. 3, figs. 9, 9*a*, *b*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills.

—— **inornatus** (M. & H.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 404. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— **inornatus** (M. & H.) Whiteaves. (1878.)
Geol. Sur. Can.; Rep. Prog. for 1876, 1877, p. 153. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— **inornatus** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 359, 360, pl. 5, figs. 16–18. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Near the Black hills.

—— **inornatus** (M. & H.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, p. 235, pl. 31, figs. 8, 8*a*, *b*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet, Skidegate inlet, south side of Alliford bay, bay east of Alliford bay.

—— ? **vancouverensis** Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 356, 357, pl. 3, figs. 5, 5*a*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, Vancouver island.

—— ? **vancouverensis** (Meek) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 39. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island.

Grammostomum americanum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 11. Leipzig, 1854. C. G. Ehrenberg.
Formation : Cretaceous.
Location : Missouri region.

—— **americanum** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 15. Leipzig, 1854. C. G. Ehrenberg.
Formation : Cretaceous.
Location : Mississippi region.

—— **invalidum** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 17. Leipzig, 1854. C. G. Ehrenberg.
Formation : Cretaceous.
Location : Mississippi region.

—— **phyllodes** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 16. Leipzig, 1854. C. G. Ehrenberg.
Formation : Cretaceous.
Location: Mississippi region.

—— **rhomboidale** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 19. Leipzig, 1854, C. G. Ehrenberg.
Formation : Cretaceous.
Location : Mississippi region.

—— **tessera** Ehrenberg. (1854.)
Mikrogeologie. Taf. 32, fig. 18. Leipzig, 1856. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **validum** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 12. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

Granoarca (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 78, 79. Wash., 1876. F. B. Meek.

Granocardium n. subgen Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 266. Phila., 1869. W. M. Gabb.

Graptocarcinus texanus n. s. Roemer. (1887.)
Neues Jahrbuch f. Mineral. Geol. u Paleont., pp. 173–176, figs. *a* and *b*, text. Stuttgart, 1887. F. Roemer.
Formation: Cretaceous.
Location: Shoal creek, near Austin, Tex.

Gryphæa [Lam.] Morton. (1828.)
Jour. Acad. Nat. Sci. Phila., vol. 6, 1st ser. 1827–1831, p. 79. Phila., 1827–1831. S. G. Morton.

—— **aucella** n. s. Roemer. (1849.)
Texas, p. 395. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Tex.

—— **bryani** (Gabb) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 206, 207, pl. 27, figs. 6–9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Vincenttown, N. J.

Gryphæa—Continued.

—— **bryani var. precedens** n. var. Whitfield. (1885.)
Mong. U. S. Geol. Sur. vol. 9, pp. 194, 195, pl. 24, figs. 7, 8. Wash., 1885. R. P. Whitfield.
Formation : Cretaceous.
Location: Throughout Monmouth county and also particularly so in the vicinity of New Egypt, N. J.

—— **calceola** (Quenstedt?) Meek. (1860.)
Rep. Expl. Great Basin Terr., Utah, p. 356, pl. 3, fig. 2. Wash., 1876. F. B. Meek.
Formation: Jurassic.
Location : Near the Red buttes, on the North Platte.

—— **calceola var. nebrascensis** n. var. M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 437–439. Phila., 1862. Meek & Hayden.
Formation: Jurassic.
Location: Head of Wind river valley, at base of mountains, Nebr.

—— **calceola var. nebrascensis** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14. No. 172, pp. 74–76, pl. 3, figs. 1 *a–e*, and annexed cuts. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Wind river mountains, southern part of Dakota: Red buttes, further east, Dakota.

—— **calceola var. nebrascensis** (M. & H.) H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 286, 287, pl. 7. fig. 11. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Sheep creek, Uinta range, Utah; and on Ashley creek, Uinta range.

—— **calceola var. nebrascensis** (M. & H.) Whiteaves. (1878.)
Canadian Naturalist vol. 8, n. ser., No. 7, p. 401. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— **calceola var. nebrascensis** (M. & H.) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–77, p. 151 Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— **calceola var. nebrascensis** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 349, 350, pl. 3, figs. 13–16. Wash., 1880. R. P. Whitfield.
Formation; Jurassic.
Location: Wind river mountains.

—— **calceola var. nebrascensis** (M. & H.) White. (1885.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 290, pl. 35, figs. 1–5. Wash., 1884. C. A. White.
Formation: Jurassic.
Location: Distant localities in Wyoming and Idaho.

hæa—Continued.

onvexa n. s. Morton. (1828.)
r. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1828–31, pp. 79, 80, pl. 4, figs. 1, 2. Phila., 1827–31. S. G. Morton.
mation: Cretaceous.
ation: Woodward's farm, near Walnford, New gypt, N. J.; St. Georges, Del.

onvexa (Say sp.) Morton. (1829.)
. Acad. Nat. Sci., Phila.. vol. 6, 1st ser., 1827–31, p. 121. Phila., 1827-1831. S. G. Morton.
mation: Cretaceous.
ation: Big Timber creek, Gloucester county, . J.

onvexa (Say sp.) Morton. (1830.)
. Jour. Sci., 1st ser., vol. 17, p. 283. New aven, 1830. S. G. Morton.
mation: [Cretaceous.]
ation: New Jersey.

onvexa (Say) Morton. (1834.)
op. Org. Rem. Cret. Gr. U. S., p. 53, pl. 4, figs. 2. Phila., 1834. S. G. Morton.
mation: Cretaceous.
ation: New Jersey, Delaware, and Alabama.

onvexa (Say) Troost. (1840.)
h Geol. Rep. Tenn., p. 46. Nashville, 1840. . Troost.
mation: Cretaceous.
ation: McNairy county, Tenn.

orrugata n. s. Say. (1823.)
ount of Exped. Pittsburg to Rocky mountains, ol. 2, pp. 410, 411. Phila., 1823. Thos. Say.
mation: [Cretaceous.]
ation: About Red river.

ilatata var. tucumcarii n. var. Mar- (1858.)
l. N. Am. pp. 43, 44, pl. 4, figs. 1, 1*a*, *b*, 2, 3. urich, 1858. Jules Marcou.
mation: Jurassic [Cretaceous].
ation: Bluffs surrounding Plaza Larga, in the d of Fossil creek, at the big and little Tucum- rii, Pyramid mount, Monte revnelto and e Llano Estacado, near the village of Covero, ew Mexico, and on the tableland or mesa be- ween Inscription rock and the Canoncito Bon- o, west of the Sierra Madre. Southern part of e Llano Estacado. Leon springs between Fort ge, Tex., and El Paso, Chihuahua.

ucronata Gabb. (1869.)
l. Sur. Cal., Paleont., vol. 2, pp. 274, 275. hila., 1869. W. M. Gabb.
mation: Cretaceous.
ation: Sierra de las Conchas, near Arivechi, onora, Mexico.

ucronata (Gabb) White. (1884.)
rth Ann. Rep. U. S. Geol. Sur., p. 302. ash., 1884. C. A. White.
mation: Cretaceous.

utabilis n. s. Morton. (1828.)
r. Acad. Nat. Sci., Phila., vol. 6, 1st. ser., 1828–31, pp. 81–83, pl. 4, fig. 3. Phila., 1827–1831. G. Morton.
mation: Cretaceous.
ation: New Jersey and Delaware.

Gryphæa—Continued.

—— mutabilis (Say sp.) Morton. (1830.)
Am. Jour. Sci., 1st. ser., vol. 17, p. 283. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— mutabilis Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 53, 54, pl. 4. fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey, Delaware, Alabama, Tennessee, and Missouri.

—— mutabilis (Mort.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 302. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— navia (Con.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 273, 274. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— navia (Con.) White. (1883.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 302, Wash., 1884. C. A. White.
Formation: Cretaceous.

—— nebrascensis (M. & H.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 244, 245, pl. 32, figs. 2, 2*a*, *b*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island; south side of Alliford bay.

—— pitcheri n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 55, pl. 15, fig. 9. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Plains of the Kiamesha, in Arkansas; falls of Verdigris river, in the same territory.

—— pitcheri (Morton) Roemer. (1849.).
Tex., pp. 394, 395. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Eight miles above New Braunfels, Mission hill, upper Brazos river, and near Fredericksburg, Tex.

—— pitcheri Morton. (1852.)
Kreide von Tex., pp. 73, 74, Taf. 9, figs. 1*a*–*c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Guadalupe river, eight miles above New Braunfels, Mission hills, upper Brazos river, and Fredericksburg, Tex.

—— pitcheri (Mort.) Shumard. (1853.)
Expl. Red river, Louisiana, by R. B. Marcy, p. 205, pl. 6, fig. 5. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Fort Washita, Ind. T.; Cross Timbers, Tex.

—— pitcheri (Mort.) Blake. (1855.)
Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol. 2; Rep. Geol. Thirty-second Parallel, p. 39. Wash., 1855. W. P. Blake.
Formation: Cretaceous.
Location: From the Big springs of the Colorado.

Gryphæa—Continued.

—— **pitcheri** (Morton) Conrad. (1855.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 155, pl. 7, fig. 3; pl. 10, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Leon springs, Tex., plains of the Kiamesha, Ark., New Braunfels, Tex., Fort Washita and Cross Timbers, Tex.

—— **pitcheri** (Mort.) Schiel. (1855.)

Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol. 2; Rep. Expl. Forty-first parallel, N. Lat., p. 108, pl. 3, fig. 9. Wash., 1855. James Schiel.

Formation: Cretaceous.

Location: Top of a sand hill near Grand river.

—— **pitcheri** (Mort.) Hall. (1856.)

Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol. 3, pt. 4, pp. 99, 100, pl. 1, figs. 1-6. Wash., 1856. James Hall.

Formation: Cretaceous.

Location: Pyramid mountain, Plaza Larga, Camp 50.

—— **pitcheri** (Morton) Marcou. (1858.)

Geol. N. Am. pp. 38-40, pl. 4, figs. 5, 5*a*, *b*, 6. Zurich, 1858. Jules Marcou.

Formation: Cretaceous.

Location: Hills surrounding Comet creek, one of the affluents of the False Washita river (Long. 99°, Lat. 35° 50′); on the bank of the Canadian; at Fort Washita; in the plain of Kiamesha, Arkansas; at the fall of the Verdigris river, affluent of the Arkansas; near Preston; in the vicinity of New Braunfels; and at Waco camp on the Rio Guadalupe, Tex.

—— **pitcheri** (Mort.) Gabb. (1860.)

Second Rep. Geol. Rec. Arkansas, pl. 7, fig. 6. Phila., 1860. D. D. Owen.

Formation: Cretaceous.

Location: Arkansas.

—— **pitcheri** (Mort.) Newberry. (1861.)

Rep. Colorado river of the West, pt. 3, p. 121. Wash., 1861. J. S. Newberry.

Formation: Cretaceous.

Location: A few miles east of Fort Defiance, still further eastward near Covera; on the banks of the Pecos, east of Albuquerque.

—— **pitcheri** (Morton) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 272, 273. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— **pitcheri** (Mort.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., pp. 302, 303, pl. 49, figs. 1-6. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **pitcheri** var. **navia** n. var. Hall. (1856.)

Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol. 3, pt. 4, p. 100, pl. 1, figs. 7-10. Wash., 1856. James Hall.

Formation: Cretaceous.

Location: False Washita, Camp 31.

—— **pitcheri** var. **navia** (Hall) Newberry. (1861.)

Rep. Colorado river of the West, pt. 3, p. 12 Wash., 1861. J. S. Newberry.

Formation: Cretaceous.

Location: At the Moqui villages; east of Fort Defiance; on the Pecos.

—— **pitcheri** var. **navia** (Hall) Whitfield. (1884.)

Mong. U. S. Sur., vol. 9, p. 38. Wash., 188 R. P. Whitfield.

Formation: Cretaceous.

Location: Monmouth county and Blue Ball, N. J.; also from Freehold, Burlington, Timber creek, and New Egypt, N. J.

—— **pitcheri** var. (Mort.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 171, 172, pl. 17, figs. 1*a*-*f*. Wash., 1875. C. A. White

Formation: Cretaceous.

Location: Twenty-five miles southwest of an also near Paria; east fork of Paria creek; east of Impracticable ridge; Dirty Devil river, east of ridge, Utah; canyon five miles west of Puerco; east of Mount Taylor, and Acoma plateau, New Mexico, etc.

—— **planoconvexa** n. s. Whitfield. (1876.)

Rep. Rec. Carroll, Mont., to Yellowstone National Park, p. 142, pl. 2, figs. 9, 10. Wash., 187 R. P. Whitfield.

Formation: Jurassic.

Location: In the Bridger mountains, Mont.

—— **plicatella** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 293, pl. 9, fig. 4, [vol. 24]. New Haven, 1833. S. G. Morton.

Formation: Cretaceous.

Location: Alabama.

—— **plicatella** Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, pl. 9, fig. 4. New Haven, 1833. S. G. Morton.

—— **sinuata** var. **americana** n. var. Marcou. (1858.)

Geol. N. Am., pp. 37, 38, pl. 3, fig. 1. Zurich, 1858. Jules Marcou.

Formation: Cretaceous.

Location: Borders of Red river, near Preston, Tex.

—— **thirsæ** n. s.* Gabb. (1861.)

Proc. Acad. Nat. Sci. Phila., for 1861, pp. 329, 330 Phila., 18 2. W. M. Gabb.

Formation: Cretaceous. [Tertiary.]

Location: "Nanafalia," Ala.

—— **thirsæ** (Gabb) White. (1884.

Fourth Ann. Rep. U. S. Geol. Sur., p. 303. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **vesicularis** (Lam.) Bronn. (1838.)

Lethæa Geognostica, Zweiter Band, pp. 671-672 Taf. 32, figs. 1 *a*-*e*. Stuttgart, 1838. H. G. Bronn.

Formation: Cretaceous.

Location: New Jersey.

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* Nanafalia Bluff referred to Tertiary by Smith & Johnson. G. thirsæ, referred to Ostrea thirsæ by Heilprin.

ryphæa—Continued.

— vesicularis (Lam.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 205. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near San Diego, Cal.

— vesicularis (Lam.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 20, 21, pl. 11, figs. 2*a–c*; pl. 16, figs. 8*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Cheyenne river, near the Black hills.

— vesicularis (Lam.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 323. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Georgetown, Ga.

— vesicularis (Lam.) White. (1883.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 303, pl. 48, figs. 1-5. Wash., 1884. C. A. White.
Formation: Cretaceous.

— vesicularis (Lam.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 194, pl. 26, figs. 9, 10. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

— vesicularis (Lam.?) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 36-39, pl. 3, figs. 15, 16; pl. 4, figs. 1-3; pl. 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: All the noted localities of the lower and middle green sands of the New Jersey Cretaceous.

— vesicularis var. aucella (Roem.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 37, 38, pl. 26, figs. 9, 10. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

— vesicularis var. convexa (Say) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 37. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Monmouth, Cream ridge, New Egypt, Harrisonville, near Mullica hill, and elsewhere in New Jersey.

— vesicularis var. mutabilis (Mort.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 38, pl. 4, fig. 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Monmouth county, N. J., Cream ridge, N. J.

— vesicularis var. No. 4. n. var. Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 38, pl. 3, fig. 15. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

Gryphæa—Continued.

—— vomer n. s. Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 83-85, pl. 5, figs. 1-3. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: Near New Egypt, N. J.

—— vomer Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pl. 3, figs. 1, 2. New Haven, 1830. S. G. Morton.

—— vomer Morton. (1830.)

Am. Jour. Sci., 1st. ser., vol. 17, p. 283. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— vomer Morton. (1830.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser. 1827-1831, pp. 197, 198, pl. 8, figs. 11, 12. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: New Egypt, N. J.

—— vomer Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, pl. 9, fig. 5, New Haven, 1833. S. G. Morton.

—— vomer Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 54, 55, pl. 9, fig. 5. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Egypt, N. J.

—— vomer (Mort.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 303. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— washitaensis n. s. Hill. (1889.)

Geol. Sur. Tex., Bull. No. 4, p. 4. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Washita limestone, extending southward continuously through Denison, Fort Worth, and Austin, Tex.

—— (—— ?) Blake. (1855.)

Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol. 2; Rep. Geol. Thirty-second parallel, p. 40. Wash., 1855. W. P. Blake.
Formation: Cretaceous.
Location: Elm fork of the Trinity river.

—— —— Meek. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 42, pl. 8, figs. 4, 4*a*. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genessee valley, Plumas county, Cal.

—— —— ? White. (1878.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? —— Whiteaves. (1882.)

Proc. and Trans. Roy. Soc. Can., vol. 1, sec. 4, p. 85. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skagit river, Canada.

Gryphæa—Continued.

—— sp. undet. Urquiza. (1882)
An. Min. Fomente Rep. Mex., Tomo 7, p. 224, fig. 16. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Astala, Coalcoman district, state of Michoacan, Mex.

Gryphæostrea (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 11. Wash., 1876. F. B. Meek.

—— (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 195. Wash., 1885. R. P. Whitfield.

—— vomer (Mont.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 195, 196, pl. 26, figs. 11, 12. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Timber creek, near New Egypt, Mullica hill, Monmouth county, N. J.

Gryphorhynchus n. g. Meek. (1864.)
Am. Jour. Sci., 2d ser., vol. 37, pp. 217, 218. New Haven, 1864. F. B. Meek.

Guttulina turrita Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 28. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Gymnarus n. subgen. Gabb. (1868.)
Am. Jour. Conch., vol. 4, p. 139. Phila., 1868. W. M. Gabb.

Gymnotoceras n. g. Hyatt. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 110, 111. Wash., 1877. Alpheus Hyatt.

—— blakei (Gabb sp.) Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 113–116, pl. 10, figs. 10, 10*a–c*, pl. 11, figs. 6, 6*a*. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Cottonwood canyon, West Humboldt range, Nev.

—— rotelliforme n. s. Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 111–113, pl. 10, figs. 9, 9*a*. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Buena Vista canyon, West Humboldt, range, Nev.

Gyraulus (subgen. ag.) Meek. (1876.)
Rep. U. S. Geol. Sur., Terr., vol. 9. p. 536. Wash., 1876. F. B. Meek.

Gyrodes (Con.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 320. Phila., 1862. W. M. Gabb.

—— abbotti n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 320–321. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, N. J.

Gyrodes—Continued.

—— abyssinus (Morton sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 2 Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— conradi n. s. Meek. (1876.)
Rep. U. S. Geol. Ser. Terr., vol. 9, pp. 310, 311, figs. 33–36, p. 310. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Cheyenne river, Dak.

—— conradiana (Gabb) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 45. Wash., 1889. C. A. White.
Formation: Cretaceous, Vancouver group.
Location: Sucia and Sheep Jack islands.

—— depressa n. s. Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 159, 160, pl. 15, figs. 1, 1a. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Chalk creek, at the mouth of the canyon above Coalville, Utah.

—— depressa (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— dowelli n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 19, pl. 3, figs. 8 and 9. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Jacksonville, Oreg.

—— expansa n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 106, pl. 19, figs. 62*a–c*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Hills southwest of Martinez; Pence's ranch, above Oroville, Butte county; north fork of Cottonwood creek; Tuscan springs; Texas flat, Placer county; Siskiyou mountains, Siskiyou county, Cal.; Jacksonville, Oreg.

—— expansa? (Gabb) Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 253. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island.

—— excavata (Michelin sp.) Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 124, 125, pl. 16, figs. 2, 2a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island; Brown river, Vancouver island; Nanaimo river, ten miles up, Vancouver island; Blunden point, Vancouver island; Sucia islands.

Gyrodes? obtusivolva n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. [illegible] Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

odes—Continued.

petrosa (Morton sp.) Gabb. (1876.)
roc. Acad. Nat. Sci., Phila., for 1876, p. 295. Phila., 1876. W. M. Gabb.
ormation: Cretaceous.
ocation: Glassboro and Mullica hill, N. J.

spillmanii n. g. Gabb. (1861.)
roc. Acad. Nat. Sci., Phila., for 1861, p. 320. Phila., 1862. W. M. Gabb.
ormation: Cretaceous.
ocation: Mississippi.

otropis n. g. Gabb. (1876.)
roc. Acad. Nat. Sci., Phila., for 1876, p. 300. Phila., 1876. W. M. Gabb.

squamosus n. s. Gabb. (1876.)
oc. Acad. Nat. Sci., Phila., for 1876, pp. 301, 301. Phila., 1876. W. M. Gabb.
rmation: Cretaceous.
cation: Snow hill, N. C.

tt, A. (1889.)
nesis of the Arietidæ, Mem. Mus. Comp. Zool., vol. 16, No. 3, p. 238, pl. 14. Cambridge, 1889.

bia (Bronn) Gabb. (1864.)
ol. Sur. Cal. Paleont., vol. 1, p. 30. Phila., 1864. W. M. Gabb.

bia? dubia n. s. Gabb. (1864.)
ol. Sur. Cal. Paleont., vol. 1, pp. 30, 31, pl. 5, igs. 28*a*, *b*. Phila., 1864. W. M. Gabb.
rmation: Triassic.
cation: Star canyon, Buena Vista district, Nev., and Gifford's ranch, Plumas county, Cal.

occidentalis n. s. Whiteaves. 39.)
ol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 134, 135, pl. 17, figs. 5, 6. Montreal, 1889. J. F. Whiteaves.
mation: Triassic.
ation: Liard river, about twenty-five miles elow Devil's Portage, Canada.

Daonella) lommeli (Wissmann) k. (1877.)
. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 100-102, pl. 10, fig. 5. Wash., 1877. F. B. Meek.
mation: Triassic.
ation: West of New Pass mines, Desatoya ountains, Cottonwood canyon, West Humoldt range, Nev.

Daonella) lommeli (Wissmann) iteaves. (1887.)
l. and Nat. Hist. Sur. Can., vol. 2, n. ser., 886, app. I, pp. 108, 109 B. Montreal, 1887. . F. Whiteaves.
mation: Triassic.
ation: South side of Houston Stewart chanel, Q. C. I.; nearly opposite Rose harbor; ection cove, north end of Barnaby island, . C. I.; bay five miles west of Cape Commeral, orth end of Vancouver island.

Halobia—Continued.

—— (Daonella) lommeli (Wissmann) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 133, 134. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: South side of Houston Stewart channel, Q. C. I.; nearly opposite Rose harbor; Liard river, about twenty-five miles below Devils Portage, Canada.

Haminea (Leach) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 270, 271. Wash., 1876. F. B. Meek.

—— horni (Gabb ?) var. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss. vol. 1, pt. 2, p. 132, pl. 16, figs. 8, 8*a*, *b*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island; southwest side of Denman island; Blundon point, and two miles and a quarter up the Nanaimo river, Vancouver island; also at Vesuvius bay, Admiralty island, and the Sucia islands.

—— minor (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 273, pl. 31, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— occidentalis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 271, 272, pl. 18, figs. 11, *a*, *b*; 12*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth; Deer creek, near Platte river.

—— occidentalis (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 45, 46. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Blood Indian creek, north of the Red Deer river, and twenty miles east of the Hand hills; South Saskatchewan, opposite Swift Current creek; Old Wives creek, township 10, range 11, west of third principal meridian, Canada.

—— subcylindrica (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 272, 273, pl. 18 figs. 10, *a*. *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the mouth of Milk river, on the Upper Missouri.

—— subcylindrica (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 437, pl. 12, fig. 24. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman fork of the Cheyenne river, Black hills.

Hamites (Park.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 44. Phila., 1834. S. G. Morton.

—— **annulifer** n. s. Morton. (1841.)
Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843, pp. 109, 110. Phila., 1843. S. G. Morton.
Formation : Cretaceous.
Location : Deep cut of the Chesapeake & Delaware canal.

—— **annulifer** n. s. Morton. (1842.)
Jour. Acad. Nat. Sci., Phila., vol. 8 1st ser., 1839–1842, p. 213, pl. 11, fig. 4. Phila., 1839–1842. S. G. Morton.
Formation : Cretaceous.
Location : Deep cut of the Chesapeake & Delaware canal.

—— **arculus** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr., U. S., pp. 44, 45, pl. 15, figs. 1, 2. Phila., 1834. S. G. Morton.
Formation : Cretaceous.
Location : Greene county, Ala.

—— **cylindraceus** (?) (Defrance) Whiteaves. (1879.)
Geol. Sur. Can.; Mes. Fos., vol. 1, pt. 2, p. 113, pl. 14, figs. 2–2*a*. Montreal, 1879. J. F. Whiteaves.
Formation : Cretaceous.
Location : Sucia islands.

—— **fremonti** n. s. Marcou. (1858.)
Geol. N. Am., p. 36, pl. 1, fig. 3. Zurich, 1858. Jules Marcou.
Formation : Cretaceous.
Location : Red river, at Preston, Tex.

—— (?) **glaber** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss, vol. 1, pt. 3, pp. 213, 214, pl. 24, figs. 2, 2*a–c*. Montreal, 1884. J. F. Whiteaves.
Formation : Cretaceous.
Location : North shore of Cumshewa inlet.

—— **larvatus** n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, pp. 265, 266. Phila., 1856. T. A. Conrad.
Formation : Cretaceous.
Location : Dallas county [Texas].

—— **larvatus** Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 165, pl. 21, fig. 8. Wash., 1857. T. A. Conrad.
Formation : Cretaceous.
Location : Leon springs, Tex.; White river, Ark.

—— **leaii** n. s. Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 53. Nashville, 1840. G. Troost.
Formation : Cretaceous.
Location : McNairy county, Tenn.

—— **mortoni** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s. pp. 396, 397, pl. 4. figs. 3*a–c*. Cambridge and Boston, 1855. Hall & Meek.
Formation : Cretaceous.
Location : Near Red Cedar island, thirty-five miles below Fort Pierre.

Hamites—Continued.

—— **ròtundatus** n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 268. Phila., 1856. T. A. Conrad.
Formation: Cretaceous.
Location : Dallas county [Texas].

—— **torquatus** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 45, pl. 15, fig. 4. Phila., 1834. S. G. Morton.
Formation : Cretaceous.
Location : Greene county, Ala.

—— ? **torquatus** (Morton) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 278. Phila., 1876. W. M. Gabb.
Formation : Cretaceous.
Location : Pataula creek, Ga. ; Uniontown, Ala.

—— **trabeatus** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 45, pl. 15, fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location : Prairie bluff, Ala.

—— **vancouverensis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 70, 71, pl. 13, fig. 18. Phila , 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Vancouver island.

—— **verneuilii** n. s. Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 52. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location : McNairy county, Tenn.

—— (?) **sp. undet.** Whiteaves. (1876.)
Geol. Sur. Can.; Mes. Foss., vol. 1, pt. 1, p. 48, pl. 9, fig. 3. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

Hamulus n. g. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 73. Phila., 1834. S. G. Morton.

—— **major** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 399, pl. 68, fig. 46. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location : Eufaula, Ala.

—— **onyx** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 73, 74, pl. 2, fig. 8; pl. 16, fig. 5. Phila., 1334. S. G. Morton.
Formation : Cretaceous.
Location : Lynchs creek, S. C.; Erie, Ala.; New Jersey.

—— **squamosus** Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 398, pl. 58 [68], fig. 45. Phila., 1858–1860. W. M. Gabb.

Haploceras beaudanti (Brong.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, pp. 205–207, pl. 26, figs. 1, 1*a*. Montreal, 1884. J. F. Whiteaves.
Formation : Cretaceous.
Location : Bear Skin bay, Skidegate inlet, Form A ; north shore of Cumshewa inlet, Form B.

Haploceras—Continued.

—— **cumshewaense** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, pp. 208, 209, pl. 24, fig. 1. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet.

—— **perezianum** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, p. 204. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South island, Skidegate channel; north shore of Cumshewa inlet.

—— **planulatum** (Sow. sp.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, pp. 207, 208, pl. 28, fig. 1. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet.

Haplophragmium sp. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungst., 1861, Band XLIV, p. 336. Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

—— Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungst, 1861, Band XLIV, p. 336. Wien, 1862. A. E. Reuss.

Haploscapha Conrad. (1875.)
Proc. Acad. Nat. Sci., Phila., for 1875, p. 467. Phila., 1875. T. A. Conrad.

—— **capax** n. s. Conrad. (1874.)
Seventh Ann. Rep. U. S. Geol. and Geogr. Sur. Ter., p. 456. Wash., 1874. T. A. Conrad.
Formation: Cretaceous.
Location: Near Denver, Colo.

Harpago (Klein) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 331. Phila., 1855–1858. T. A. Conrad.

—— **tippanus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 331, pl. 35, fig. 25. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Haydenia n. g. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 98. Phila., 1864. W. M. Gabb.

—— **impressa** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 98, pl. 18, fig. 51. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, and Pence's ranch, Butte county, Cal.

Helcion (Montfort) M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 68. Phila., 1857. Meek & Hayden.

—— **alveolus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 68. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, Nebr.

—— **carinatus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 68, 69. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, Nebr.

—— **circularis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 141, pl. 29, figs. 234, 234*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

—— **dichotoma** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 141, pl. 21, fig. 104. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **patelliformis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 68. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from mouth, Nebr.

—— **sexsulcatus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 68. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone, one hundred and fifty miles from mouth, Nebr.

—— **striatum** n. s. Eichwald. (1871.)
Geog. Paleont., Bemerk. Halb. Mang. Aleutischen Inseln, pp. 156, 157, Taf. 12, fig. 4. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **suboratus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 68. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, Nebr.

Helicancylus n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 140, 141. Phila., 1869. W. M. Gabb.

—— **æquicostatus** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 141–143, pl. 25, figs. 20*a*–9. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

Helicaulax n. g. Gabb. (1868.)
Am. Jour. Conch., vol. 4, p. 145. Phila., 1868. W. M. Gabb.

—— **bicarinata** n. s. Gabb. (1869)
Geol. Sur. Cal. Paleont., vol. 2, pp. 166, 167, pl. 27, fig. 47. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

Helicaulax—Continued.

—— **costata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 167, pl. 28, fig. 48. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Helicoceras (d'Orb.) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 190. Boston, 1862. B. F. Shumard.

—— **angulatum** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 176. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Head of the south branch of Cheyenne river, Nebr.

—— **declive** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 73, pl. 28, figs. 200, 200*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pences ranch, Butte county, Cal. (Div. A.)

—— **brewerii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 72, pl. 14, figs. 22, 22*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pences ranch, twelve miles north of Oroville, Butte county, Cal.

—— **pariense** n. s. White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. West of one hundredth meridian, vol. 4, pt. 1, pp. 203, 204, pl. 19, figs. 2*a*, *d*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

—— **mortoni** (M.) Stanton. (1887.)
Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 187. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— **mortoni** var. **teniucostatum** n. var. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 487–489, pl. 22, figs. 3*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri river, below Fort Pierre.

—— **navarroensis** n. s. Shumard. (1861.)
Proc. Bos. Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 190, 191. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point, Navarro county, Tex.

—— **stevensoni** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region: Prelim. Rep. Paleont., Black Hills, pp. 39, 40. Wash., 1879. R. T. Whitfield.
Formation: Cretaceous.
Location: On the west side of Beaver creek, southwest Black hills.

—— **stevensoni** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 447–449, pl. 14, figs. 5–8. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the west side of Beaver creek, Black hills.

Helicoceras—Continued.

—— **stevensoni** (Whitfield.) Stanton. (1887.)
Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 187. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— **tenuicostatus** n. s. M. & H. (1858).
Proc. Acad. Nat. Sci., Phila., for 1858, p. [illegible] Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Great bend of the Missouri.

—— ? **tortus** n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, pp. 54, 55. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Great bend of the Missouri.

—— ? **vermicularis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 71, 72, pl. 14, figs. 19, 19*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Hill southwest of Martinez, in Contra Costa county, Cal.

—— **vespertinus** n. s. Conrad. (1874.)
Seventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 455. Wash., 1874. T. A. Conrad.
Formation: Cretaceous.
Location: Seven miles southeast of Fairplay, Colo.

Helisoma (subgen. Swain) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 535. Wash., 1876. F. B. Meek.

Helix (Linn) White. (1876.)
Rep. Geol. Uinta Mts., p. 120. Wash., 1876. C. A. White.

—— (Linn, typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 549. Wash., 1876. F. B. Meek.

—— **evansi** n. s. [M] & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 175. Phila., 1861. Meek & Hayden.
Formation: [Tertiary] Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **evanstonensis** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 714. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Near Evanston, Wyo.

—— **evanstonensis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 244. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyo.

—— **evanstonensis** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 48, pl. 27, figs. 29–31. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Evanston, Wyo.

—— **kanabensis** n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 120. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, Utah.

x—Continued.

kanabensis White. (1883.)
ird Ann. Rep. U. S. Geol. Sur., p. 48, pl. 25, figs. 12-14. Wash., 1883. C. A. White.
rmation: Cretaceous.
cation: Southern Utah.

occidentalis n. s. M. & H. (1857.)
oc. Acad. Nat. Sci., Phila., for 1857, p. 136. Phila., 1858. Meek & Hayden.
rmation: Cretaceous.
cation: Mouth of Judith river, Nebr.

vetusta (M. & H.) Meek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, p. 552, pl. 42, figs. 7*a*, *b*. Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: Mouth of Judith river, Mont.

vetusta (M. & H.) Meek. (1876.)
p. U. S. Geol. Sur. Terr., vol. 9, p. 552, pl. 42, figs. 7*a*, *b*. Wash., 1876. F. B. Meek.
rmation: Cretaceous.
cation: Mouth of Judith river, on the Missouri.

vetusta (M. & H.) White. (1883.)
relfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 88. Wash., 1883. C. A. White.
rmation: Cretaceous.
cation: Mouth of Judith river, Mont.

? **vetusta** (M. & H.) White. (1883.)
ird Ann. Rep. U. S. Geol. Sur., p. 48, pl. 27, fig. 28. Wash., 1883. C. A. White.
rmation: Cretaceous.
cation: Upper Missouri river region.

vitrinoides n. s. M. & H. (1857.)
oc. Acad. Nat. Sci., Phila., for 1857, p. 135. Phila., 1858. Meek & Hayden.
rmation: Cretaceous.
cation: Mouth of Judith river, Nebr.

(**Patula**) **sepulta** n. s. White. 880.)
oc. U. S. Nat. Mus., vol, 3, p. 160. Wash., 880. Smithson. Misc. Coll., vol. 22. Wash., 882. C. A. White.
rmation: Cretaceous.
cation: Evanston, Wyo.

iaster (Desor) d'Orb. (1853.)
eont. Francaise. Echinoides Irreguliers, Terr. Cret. 1, Sixieme, pp. 220-223. Paris, 1853-1860. A. d'Orbigny.

Desor. (1858.)
3op. F [illegible] Foss., p. 367. Paris and Wiesbade, [illegible] sor.

eleg [illegible] Shumard. (1853.)
pl. Rec [illegible] iver Louisiana, by R. B. Marcy, p. 10, pl. 2, figs. 4*a*-*c*. Wash., 1853. B. F. Shumard.
rmation: Cretaceous.
cation: Fort Washita, Ind. T.

? **humphreysanus** n. s. (M. & H.) 57.)
c. Acad. Nat. Sci., Phila., for 1857, pp. 147, 48. Phila., 1858. Meek & Hayden.
rmation: Cretaceous.
cation: Yellowstone river, Nebr.

Hemiaster—Continued.

—— **humphreysanus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 5, 6, pl. 10, figs. 1*a*-*g*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Upper Missouri.

—— **parastatus** (Mont.) Marcou. (1853.)
Geol. map of the U. S. and British Provinces of N. A., p. 47, pl. 7, fig. 8. Boston, 1853. Jules Marcou.
Formation: Cretaceous.
Location: Timber creek, N. J.

—— **parastatus** (Morton sp.) Desor. (1858.)
Synop. Echinoides Foss., pp. 373, 374. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

—— **stella** (Morton sp.) Desor. (1858.)
Synop. Echinoides Foss., p. 373. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Prairie bluff, Ala., and Timber creek, N. J.

—— **texanus** n. s. Roemer. (1849.)
Texas, p. 393. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— **texanus** Roemer. (1852.)
Kreide von Tex., p. 85, Taf. 10, figs. 4*a*-*c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— **stella** (Desor) d'Orb. (1875.)
Paleont. Francaise, Echinoides Irreguliers, Terr. Cret. 1, Sixieme, pp. 245, 246, pl. 882. Paris, 1853-1860. A. d'Orbigny.
Formation: Cretaceous.
Location: Prairie bluff, Ala., Timber creek, N. J.

Hemicidaris sp. undet. Hill. (1889.)
Geol. Sur. Tex., Bull., No. 4, p. 2, Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: West of Austin, Tex.

Hemifusus subgen. (Swains.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 86. Phila., 1864. W. M. Gabb.

Hercodon n. g. Conrad. (1875.)
Rep. Geol. Sur. N. Carolina, vol. 1. Raleigh, 1875, W. C. Kerr., App. A, p. 10. T. A. Conrad.

—— **ellipticus** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr., App. A, p. 10, pl. 2, figs. 2, 8. T. A. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

Hercoglossa (subgen. Conrad) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 491. Wash., 1876. F. B. Meek.

Hercorhynchus n. g. Conrad. (1868.)

Am. Jour. Conch., vol. 4, p. 247. Phila., 1868. T. A. Conrad.

—— **tippana** Conrad. (1868.)

Am. Jour. Conch., vol. 4, p. 247. Phila., 1868. T. A. Conrad.
Formation: Cretaceous.

Heteroceras (d'Orb.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 477, 478. Wash., 1876. F. B. Meek.

—— ? **angulatum** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 484, 485, pl. 21, figs. 3*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Head of south branch of Cheyenne river, Dak.

—— ? **cheyennense** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 483, 484, pl. 21, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Big Cheyenne river, Dak.

—— ? **cochleatum** (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 478, 479, pl. 22, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri, below Fort Pierre, Dak.

—— **cochleatum** (M. & H.) Stanton. (1887.)

Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 187. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— **conradi** (Mort. sp.) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 100–102, pl. 12. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornsby island; Trent river (above and below the falls); Bradly creek, V. I.; Salt spring or Admiralty island; Maple bay, Vancouver island.

—— **cooperi** (Gabb) (sp.) Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 367, pl. 3, figs. 7, 7*a*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, Vancouver island.

—— ? **nebrascense** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 480, 481, pl. 22, figs. 1*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the Forks of Cheyenne river, Dak.

Heteroceras—Continued.

—— ? **nebrascense** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 451, 45 pl. 15, fig. 6; pl. 14, fig. 9. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the west side of the east fork of Beaver creek, Black hills.

—— **nebrascense** (M. & H.) Stanton. (1887.)

Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 186. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— **newtoni** n. s. Whitfield. (1879.)

U. S. Geogr. and Geol. Sur., Rocky Mountain region; Prelim. Rep. Paleont., Black Hills, pp. 40, 41. Wash., 1879. R. P. Whitfield.
Formation: Cretaceous.
Location: On the west side of Beaver creek, southwest Black hills.

—— **newtoni** Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 449–451, pl. 15, figs. 1–4. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the west side of Beaver creek, Black hills.

—— **tortum** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 481, 482, pl. 22, figs. 4*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri below Fort Pierre, Dak.

—— **tortum** (M. & H ?) Stanton. (1887.)

Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, pp. 18 187. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— ? **umbilicatum** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 482, 48 pl. 22, fig. 5. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri below Fort Pierre, Dak.

Heterocrisina n. g. G. & H. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 404. Phila., 1858–1860. Gabb & Horn.

—— **abbottii** n. s. G. & H. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 404, pl. 69, figs. 45–47. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

Heteroterma n. g. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 151, 15 Phila., 1869. W. M. Gabb.

roterma—Continued.

trochoidea n. s. Gabb. (1869.)

ol. Sur. Cal. Paleont., vol. 2, p. 152, pl. 26, figs. 30, 30*a*. Phila., 1869. W. M. Gabb.

rmation: Cretaceous.

cation: Martinez, Cal.

angia americana n. s. M. & H. 56.)

c. Acad. Nat. Sci., Phila., for 1856, p. 274. hila., 1857. Meek & Hayden.

rmation: Cretaceous.

cation: Mouth of Judith river, Nebr.

sia nodulosa,Whiteaves sp. (1879.)

l. Sur. Cal. Mes. Foss., vol. 1, pt. 2, pp. 125-27, pl. 15, figs. 6 and 7. Montreal, 1879. J. F. Whiteaves.

mation: Cretaceous.

ation: Nanaimo river, two miles and a half p, Vancouver island; Protection island.

ites ? sp. undet. Ramirez. (1880.)

. Min. Fomento Rep. Mex., Tomo 3, p. 656, am. 1, fig. 4. Mexico, 1880. S. Ramirez.

mation: Cretaceous.

ation: Sierra Mojada, Mexico.

ites, or **Spondylus** sp. undet. iteaves. (1879.)

l. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 175. ontreal, 1879. J. F. Whiteaves.

mation: Cretaceous.

ation: Entrance to Departure bay, Vancouver land.

nyx [Defrance] Morton. (1841.)

r. Acad. Nat. Sci., Phila., vol. 8, 1st ser. 1839-42, p. 210. Phila., 1839-1842. S. G. Morton.

orealis n. s. Morton. (1841.)

r. Acad. Nat. Sci., Phila., vol. 8, ser., 1839-42, p. 210, pl. 11, fig. 6. Phila., 1839-1842. G. Morton.

nation: Cretaceous.

ation: Great bend of the Missouri river (Lat. ° 40′ N.).

thoa irregularis n. s. G. & H. .)

. Acad. Nat. Sci., Phila., for 1860, p. 366. ila., 1861. Gabb & Horn.

nation: Cretaceous.

tion: New Jersey.

. g. Gabb. (1860).

. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-60, p. 400. Phila., 1858-1860. W. M. Gabb.

regularis (G. & H.) Gabb. (1860.)

. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-60, p. 400, pl. 69, figs. 18-20. Phila., 1858-60. W. M. Gabb.

nation: Cretaceous.

tion: Timber creek, N. J.

G. & H. (1862.)

. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 63, p. 179 [pl. 21], fig. 71. Phila., 1862, 1863. bb & Horn.

nation: Cretaceous.

tion: New Jersey.

Hippurites (Lam.) Barcena. (1877.)

An. Museo. Nac. Mex., Tomo 1, p. 196, Mexico, 1877-1879. M. Barcena.

—— **austinensis** n. s. Roemer. (1849.)

Tex., p. 410. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Austin, Tex.

—— **bioculatus** (Lam.) Urquiza. (1882.)

An. Min. Fomento Rep. Mex., Tomo 7, p. 222, figs 1*a*, 2*a*. Mexico, 1882. M. Urquiza.

Formation: Cretaceous.

Location: Coalçoman district, state of Michoacan, Mexico.

—— **calamitiformis** Barcena.* (1877.)

An. Museo. Nac. Mex., Tomo 1, pp. 197, 198, fig. 15. Mexico, 1877-1879. M. Barcena.

Formation: Cretaceous.

Location: Caderegta and Apasco, state of Queretaro, Mexico.

—— **calamitiformis** (Barcena) Urquiza. (1882.)

An. Min. Fomento Rep. Mex., Tomo 7, pp. 222, 223, fig. 3*a*. Mexico, 1882. M. Urquiza.

Formation : Cretaceous.

Location: Road to Rincon mine, Coalcoman district, state of Michoacan, Mexico.

—— **mexicana** Barcena. (1877.)

An. Museo. Nac. Mex., Tomo 1, pp. 196, 197, figs. 11-14. Mexico, 1877-1879. M. Barcena.

Formation: Cretaceous.

Location : Apasco, state of Mexico; Yantopec, state of Morelos; Sierra de Barbosa and Cañada Grande, state of San Luis Potosi, Mexico.

—— **mexicana** (Barcena) Ramirez. (1880.)

An. Min. Fomento Rep. Mex., Tomo 3, pp. 655, 656, Lam. 1, fig. 1*a*. Mexico, 1880. S. Ramirez.

Formation: Cretaceous.

Location: Seirra Mojada, Mexico.

—— **mexicana** [Barcena] Urquiza. (1882.)

An. Min. Fomento Rep. Mex., Tomo 7, p. 223, figs. 4, 5. Mexico, 1882. M. Urquiza.

Formation: Cretaceous.

Location: Road to Rincon mine and San Gsidro Coalcoman district, state of Michoacon, Mexico.

—— **sabinae** n. s. Roemer. (1849.)

Tex., p. 410. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Sabine creek on road from New Braunfels to Fredericksburg, Tex.

—— **texana** n. s. Roemer. (1849.)

Tex , pp. 409, 410. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Upper course of Pedernales river, Tex.

—— **texanus** Roemer. (1852.)

Kreide von Tex., pp. 76, 77, Taf. 5, figs. 1*a*-*e*. Bonn, 1852. F. Roemer.

Formatiom : Cretaceous.

Location: Boulder in the Guadalupe near New Braunfels, Tex.

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*(n. s.?) See datos paro el estudio de lar arcar Mesozoicos des Mexico, etc., 1874.

Hippurites—Continued.

—— **sp. undet. Roemer.** (1849.)
Tex., p. 410. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Well at New Braunfels, Tex.

—— **sp. undet. Roemer.** (1852.)
Kreide von Tex., p. 77. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: New Braunfels, Tex.

—— **sp. undet. Urquiza.** (1882.)
An. Min. Fomento Rep. Mex., Tomo 7, p. 223, fig. 6. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: San Isidro, Coalcoman district, state of Michoacan, Mexico.

Holaster (Agas.) Conrad. (1850.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 40. Phila., 1850–1854. T. A. Conrad.

—— **cinctus** (Mort. sp.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 218. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville, N. J.

—— **comanchesi** n. s. Marcou. (1858.)
Geol. N. Am., pp. 40, 41, pl. 3, figs. 3, *3a*, *b*. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Borders of Red river, near Preston, Tex.

—— **comanchesi** (Marcou) Desor. (1858.)
Synop. Echinoides Foss., p. 449. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Bank of Red river, near Preston, Tex.

—— **mortoni** (Couper MSS.) Conrad. (1850.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 40, pl. 1, fig. 10. Phila., 1850–1854. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Palmyra, Lee county, Ga.

—— **simplex** n. s. Shumard. (1853.)
Expl. Red River, La., by R. B. Marcy, pp. 210, 211, pl. 3, fig. 2. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Fort Washita, Ind. T.

—— **simplex** (Shumard) Desor. (1858.)
Synop. Echinoides Foss., p. 450. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Red river [Tex].

Holectypus Desor. (1858.)
Synop. Echinoides Foss., pp. 168, 169. Paris and Wiesbade, 1858. E. Desor.

—— **sp. Roemer.** (1888.)
Paleont. Abhandl. Vierter Band., Heft 4, p. 9, Taf. 1 [xxxi] figs. *6a–6c*. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

Holectypus—Continued.

—— **castilloi** n. s. Cotteau. (1890.)
Bull. Soc. Geol. France, 3d ser., vol. 18, No. 4 pp. 295, 296, pl. 1. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: Jalpa (Jalisco).

—— **castilloi** n. s. Cotteau. (1890.)
Bull. Soc. Geol. France, 3d ser., vol. 18, pp. 295, 296, pt. 1. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: Jalpa (Jalisco), Mexico.

—— **planatus** n. s. Roemer. (1849.)
Tex., p. 393. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba river, Tex.

—— **planatus** Roemer. (1852.)
Kreide von Tex., p. 84, Taf. 10, figs. *2a–e*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba valley, fifteen miles below old Spanish fort, Tex.

—— **planatus** (Roem.) Shumard. (1853.)
Expl. Red River, La., by R. B. Marcy, p. 211. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Tex.

—— **planatus** n. s.? Hall. (1854.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 145, 146, pl. 1, figs. *4a–f*. Wash., 1857. James Hall.
Formation: Cretaceous.
Location: Leon springs, Tex.

—— **planatus** (Roemer) Desor. (1858.)
Synop. Echinoides Foss., p. 174. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Fredericksburg and San Saba river, Tex.

Homalina (subgen. Stoliczka) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 194. Wash., 1876. F. B. Meek.

Homomya (Agas.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 179. Phila., 1869. W. M. Gabb.

—— **alta** n. s. Roemer. (1852.)
Kreide von Tex., p. 45, Taf. 6, fig. 11. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **concentrica** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 179. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Cottonwood creek, and Martinez, Cal.

—— **concentrica** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 141. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

Homomya—Continued.

—— sp. undet. Roemer. (1849.)
Tex. p. 408. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

Hoploparia (?) canadensis n. s. Whiteaves. (1884.)
Proc. and Trans. Roy. Soc. Can., vol. 2, Sec. 4, pp. 237, 238. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Highwood river, Alberta, Northwest Territory.

—— ? canadensis Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 87–89, pl. 11. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Highwood river (a tributary of the Bow river), ten miles west of the first fork, Canada.

Hyalina (Ferussæ) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 545–547. Wash., 1876. F. B. Meek.

—— ? evansi (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 548, 549, figs. 68–70, p. 548. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— ? evansi (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 46, pl. 27, fig. 26. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— ? occidentalis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 547, 548, pl. 42, figs. 6*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— ? occidentalis (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 87, 88. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: [Mouth of Judith river, Mont.]

—— ? occidentalis (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 87, 88. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: [Mouth of Judith river, Mont.]

—— ? occidentalis (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 46, pl. 27, fig. 27. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Hydatina parvula Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 180, 181, pl. 24, figs. 5, 5*a*. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sounding creek, township 30, range 8, west of the fourth principal meredian. Northwest Territory.

Hydrobia (Hartmann) Meek. (1876.)
Report U. S. Geol. Sur. Terr., vol. 9, p. 571. Wash., 1876. F. B. Meek.

—— anthonyi (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 97. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— anthonyi (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 571, 572, pl. 43, figs. 10*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Probably Eocene. [Cretaceous.]
Location: Yellowstone river, thirty miles above its mouth.

—— anthonyi (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 59, pl. 27, fig. 38. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— ? eulimoidea n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 573, 574, fig. 78, p. 573. Wash., 1876. F. B. Meek.
Formation: Probably Eocene. [Cretaceous.]
Location: Clear fork of Powder river, Mont.

—— ? eulimoides (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 97. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— ? eulimoides (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 59, pl. 27, fig. 37. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— recta n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 132. Wash., 1876. C. A. White.
Formation: Tertiary. [Cretaceous.]
Location: Almy coal mines, near Evanston, Wyo.

—— recta White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coal mines three miles from Evanston, Wyo.

—— recta White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 60, pl. 27, fig. 38. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Evanston, Wyo.

Hydrobia—Continued.

—— **subconica n. s. Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 573, fig. 77, p. 573. Wash., 1876. F. B. Meek.

Formation: Probably Eocene. [Cretaceous.]

Location: Mouth of Judith river, Mont.

—— **subconica** (M. & H.) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 97. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— **subconica** (Meek) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 59, pl. 27, fig. 36. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— **subcylindracea** n. s. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 75, 76, pl. 10, fig. 8. Mont., 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Belly river, east side of Driftwood bend; north side of Milk river, five miles below Pa-kow-ki coulee, Can.

—— **utahensis** n. s. White. (1876.)

Rep. Geol. Uinta Mts., pp. 132, 133. Wash., 1876. C. A. White.

Formation: Tertiary [Cretaceous].

Location: West base of Mu-si-ni-a plateau, 1,000 feet below the summit, Utah.

—— **utahensis** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 60, pl. 27, fig. 35. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Utah.

—— **warrenana** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 572, 573, pl. 43, figs. 11*a–c*. Wash., 1876. F. B. Meek.

Formation: Probably Eocene [Cretaceous].

Location: Thirty miles below Fort Clarke, Dak., from the summit of Squares butte.

—— **warrenana** (M. & H.) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 97. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— **warrenana** (M. & H.) White. (1883.)

Third Ann. Rep U. S. Geol. Sur., p. 59, pl. 27, fig. 40. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— —— ? Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 23. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: North or second branch of the Milk river; Old Man river, two miles above Rye-Grass flat; Pincher creek, Canada.

Hypogella (Gray) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 175. Phila., 1869. W. M. Gabb.

Hyridella (subgen. Swain) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Ichthyosarcolites anguis Roemer. (1888.)

Paleont. Abhandl. Vierter Band, Heft 4, pp. 9, 10, Taf. I [xxvi], figs. 7*a*, 7*b*; Taf. II [xxxii], figs. 2*a*–2*d*. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Barton creek, near Austin, Tex.

Idmonea G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 167. Phila., 1862, 1863. Gabb & Horn.

—— **contortilis** n. s. Lonsdale. (1884.)

Quart. Jour. Geol. Soc., London, vol. 1, pp. 68, 69, figs. *a–e*, p. 68. London, 1845. William Lonsdale.

Formation: Cretaceous.

Location: Timber creek, N. J.

—— **contortillis** (Lonsd.) G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 167. Phila., 1862, 1863. Gabb & Horn.

Formation: Cretaceous.

Location: Timber creek, and near Mullica hill, N. J.

Idonearca n. g. Conrad. (1872.)

Proc. Acad. Nat. Sci., Phila., for 1872, p. 54. Phila., 1872. T. A. Conrad.

—— (subgen. Conrad) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 84. Wash., 1876. F. B. Meek.

—— **alabamensis** n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 315. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Prairie bluffs, Ala.

—— ? **antrosa** (Mort. sp.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 315. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: New Jersey.

—— **antrosa** (Mort.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 96–98, pl. 13, figs. 6–11. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Marlboro, Monmouth county; near Holmdel; Freehold, N. J.

—— **capax** Conrad. (1872.)

Proc. Acad. Nat. Sci., Phila., for 1872, p. 54, pl. 2, fig. 2. Phila., 1872. T. A. Conrad.

Formation: Cretaceous.

—— **carolinensis** [n. s.] Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, pp. 314, 315. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Snow hill, N. C.

Idonearca—Continued.

—— **compressirostra** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 199, 200, pl. 26 figs. 15, 16. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Mr. J. S. Cook's pits, Tinton falls, Monmouth county, N. J.

—— **depressa** n. s. White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, pp. 183, 184, pl. 18, figs. 13*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: East bank of Rio Puerco, six miles below Casa Salazan, N. Mex.

—— **littlei** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 316. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— **medians** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 199, pl. 26, figs. 5, 6. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Cook's marl pits at Tinton falls, N. J.

—— **neglecta** (Gabb sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 314. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey; Prairie bluff, Ala.

—— **quindecemradiata** (——) Cook. (1868.)
Ann. Rep. Geol. Sur. N. J., for 1868, p. 376, fig. —, p. 376. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

—— **shumardi** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 405, 406, pl. 11, figs. 8–11. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Old Woman fork, Black hills.

—— **tippana** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 95, 96, pl. 12, figs. 19–21. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Deep cut of the Holmdel and Keyport turnpike, Monmouth county, N. J.

—— **vulgaris** (Mort. sp.) Cook. (1868.)
Ann. Rep. Geol. Sur. N. J., for 1868, p. 376, fig. —. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

—— **vulgaris** (Morton sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 313. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **vulgaris** (Mort.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 98, 99, pl. 13, figs. 1–5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, Freehold, Woodbury, Burlington, Mullica hill, Marshallville, N. J.

Idonearca—Continued.

—— **sp. ?** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 315, 316. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

Inoceramus [Sowerby] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 62. Phila., 1834. S. G. Morton.

—— (subgen. Sowerby) typical, Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 38, 39. Wash., 1876. F. B. Meek.

—— **altus** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 302, 303. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Near Medicine Bow station, Union Pacific railroad.

—— **altus** (Meek) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 391, pl. 9, fig. 11. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Belle Fourche, ten miles west of Crow Peak, Black hills.

—— **altus** (Meek) Whiteaves. (1885.)
Geol. and Nat. His. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 33. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: East fork of the Milk river, Canada.

—— **alveatus** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 63, pl. 17, fig. 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Greene county, Ala.

—— **ambiguus** n. s. Eichwald. (1871.)
Geogr. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 189–191, Taf. 20, figs. 1–5, St. Petersburg, 1871. E. Eichwold.
Formation: Cretaceous.
Location: Alaska.

—— **argenteus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 329, pl. 34, fig. 16, Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **aviculoides** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 181, Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Little Blue river, Nebr.

—— **balchii** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 180, 181. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: White river above the Mamaisés Terres, Terres, Nebr.

Inoceramus—Continued.

—— barabini n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 62, 63, pl. 17, fig. 3; pl. 13, fig. 11. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Greene county, Ala.

—— barabini Morton. (1841.)

Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 211. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Great bend of the Missouri river (Lat. 43° 40′ N.).

—— barabini (Mort.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 180, 181, pl. 16, fig. 4*a*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: One and a quarter miles south of Boulder, Colo., and at Gallinas creek, N. Mex.

—— barabini (Morton) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 205. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colo.

—— barabini (Morton) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 224. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near White River Indian agency, Colo.

—— barabini (Mort.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 398–400, pl. 7, fig. 7; pl. 9, fig. 8. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Cheyenne river, near Boxelder creek, and on Beaver creek, two to three miles west of the Black hills.

—— barabini (Mort.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 75, 76, pl. 15, figs. 3–5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel and Marlboro, N. J.

—— barabini (Mort.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 33. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Twelve miles east of White Mud river (or Frenchmans creek); Elbow of South Saskatchewan, Canada.

—— brownii n. s. Cragin. (1889.)

Bull. Washb. Coll. Lab. Nat. His., vol. 2, No. 10, pp. 67, 68. Topeka, 1889. F. W. Cragin.
Formation: Cretaceous.
Location: Fort Hays limestone, and at some ten to twenty feet above the base of the latter, at a locality, known as "Devils gap," near the post office of Tapley, in Osborne county, Kans.

—— canadensis n. s. Meek. (1859.)

N. W. Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind., pp. 183, 184, pl. 1, figs. 4 and 4. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: Little Souris river, Canada.

Inoceramus—Continued.

—— capulus n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 606. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Lamar county, Tex.

—— concentricus (Parkinson) Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 79, 80. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— concentricus (Parkinson) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 241. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet; Skidegate inlet, at Bear Skin bay; South island.

—— confertim-annullatus n. s. Roemer. (1849.)

Tex., p. 402. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Tex.

—— confertim-annulatus Roemer. (1852.)

Kreide von Tex., p. 59, Taf. 7, fig. 4. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, Tex.

—— confertim-annulatus (Roemer.) Shumard. (1853.)

Expl. Red River, La., by R. B. Marcy, p. 206, pl. 6, fig. 2. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Camp No. 4, Cross timbers, Tex.

—— confertim-annulatus (Roem.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 151, pl. 5, figs. 5. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Near New Braunfels, Tex.

—— confertim-annulatus (Roemer.) Schiel. (1855.)

Rep. Expl. and Sur. P. R. R., Mississippi river to Pacific ocean, vol. 2; Rep. Expl. forty-first parallel north latitude, p. 108, pl. 2, fig. 7. Wash., 1855. James Schiel.
Formation: Cretaceous.
Location: Upper Green river county.

—— conradi n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 387, 388, pl. 2, fig. 5*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: On the Missouri river, five miles below the mouth of the Vermilion river.

oceramus—Continued.

- convexus n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 386, 387, pl. 2, figs. 2*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek.

- costellatus n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 329, pl. 34, fig. 12. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

- crassalatus n. s. White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, p. 166, pl. 13, figs. 4*a*–*c*. Wash., 1875. C. A. White.
Formation: Jurassic.
Location: North fork of Virgin river, Utah.

- crippsii (Mantell) Roemer. (1849.)

Tex., p. 401. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Tex.

- crippsii (Mantell) Roemer. (1852.)

Kreide von Tex., pp. 56–58, Taf. 7, fig. 2. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, and crossing of the Cibolo between New Braunfels and San Antonio, Tex.

- crippsii var. barabini (Mort.) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 173, 174. Montreal, 1878. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

- crippsii (?) var. subundatus Meek. 876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 358, 359, pl. 3, figs. 1, 1*a* and 3, 3*a*, [2 figs. in text.] Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Sucia island.

- crippsii var. suciensis n. var. hiteaves. (1879.)

eol. Sur. Can. Mes. Foss, vol. 1, pt. 2, p. 173. Montreal, 1879. J. F. Whiteaves.
ormation: Cretaceous.
ocation: Southwest side of Denman island.

- crippsii var. proximus (Tuomey) hiteaves. (1879.)

eol. Sur. Can. Mes. Foss, vol. 1, pt. 2, pp. 172, 173. Montreal, 1879. J. F. Whiteaves.
ormation: Cretaceous.
ocation: Lower part of the Trent river, Nanaimo river, two miles and a quarter up, and Blunden point, Vancouver island, Sucia islands.

- crippsii (Mantell) Conrad. (1857.)

ep. U. S. and Mex. Bound. Sur., vol. 1, pl. 2, p. 152, pl. 5, fig. 8. Wash., 1857. T. A. Conrad.
ormation: Cretaceous.
ocation: San Antonio, Tex., Green county, Ala.

Inoceramus—Continued.

—— crippsii (?) (Mantell) Newberry. (1861.)

Rep. Colorado River of the West, pt. 3, p. 119. Wash., 1861. J. S. Newberry.
Formation: Cretaceous.
Location: At the Moqui villages.

—— cuneatus n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 180. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above the mouth, Nebr.

—— cuneiformis (d'Orb) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 195, 195. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— deformis (Meek) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, pp. 179, 180, pl. 15, figs. 1*a*-*b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Five miles above Pueblo, Colo.

—— deformis Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 146–148, pl. 14, figs. 4, 4*a*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Common in Kansas, and near Pueblo and Colorado city, as well as at other places in Colorado along eastern base of Rocky mountains, and farther west; everywhere in the Benton and Niobrara groups.

—— deformis (Meek) White. (1878.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— dimidius n. s. White. (1874.)

Prelim. Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, G. M. Wheeler, pp. 25, 26. Wash., 1874. C. A. White.
Formation: Cretaceous.
Location: Ojodel Pescado, N. Mex.

—— dimidius n. s. White. (1874.)

Prelim. Rep. Invert. Foss. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, pp. 25, 26. Wash., 1874. C. A. White.
Formation: Cretaceous.
Location: Ojodel Pescado, N. Mex.

—— dimidius White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, pp. 181, 182, pl. 16, figs. 2*a*–*d*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Ojodel Pescado, N. Mex.

—— elliottii n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 193, pl. 31, fig. 90*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Alcatraz island, San Francisco harbor, Cal.

Inoceramus—Continued.

—— erectus n. s. Meek. (1870.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 145, pl. 13, figs. 1, 1a; pl. 14, fig. 3. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Chalk creek, near Uptown, Utah.

—— erectus (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— eximius n. s. Eichwald. (1871.)

Geogr. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 192–194, Taf. 18, figs. 1–4; Taf. 19, figs. 3, 4. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: South coast of Tukusitnu bay, Alaska.

—— exogyroides n. s. M. & H. (1862.)

Proc. Acad. Nat. Sci., Phila., for 1862, pp. 26, 27. Phila., 1863. Meek & Hayden.
Formation: Cretaceous.
Location: Chippewa point, near Fort Benton, on the Missouri river.

—— flacidus White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, pp. 178, 179, pl. 16, figs. 1*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Five miles above Pueblo, Colo.

—— fragilis n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 388, pl. 2, figs. 6, *a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: On the Missouri river, five miles below the mouth of Vermilion river.

—— fragilis (H. & M.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, p. 178, pl. 15, fig. 3*a*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

—— fragilis (H. & M.) Meek. (1876.)

Rep. Expl. Exped. Santa Fe, N. M., to junction of Grand and Green rivers, p. 127. pl. 1, fig. 6. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Vado del Chama.

—— fragilis (H. & M.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 390, 391, pl. 9, fig. 10. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Beaver creek, and on the eastern fork of the same, Black hills.

—— gilberti n. s. White. (1876.)

Rep. Geol. Uinta Mts., pp. 113, 114. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Near Last Chance creek, southern Utah.

Inoceramus—Continued.

—— gilberti White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur Terr., p. 285, pl. 3, figs. 1*a*, *c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Last Chance creek, southern Utah.

—— howelli n. s. White. (1876.)

Rep. Geol. Uinta Mts., pp. 114, 115. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Lower Potato valley and Upper Pine creek, Utah.

—— howelli White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 229. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Dodd's ranch, on Ashley's fork, Utah.

—— howelli White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 284, 285, pl. 4, figs. 1*a*–*c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— incurvus n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 27. Phila., 1837. Meek & Hayden.
Formation: Cretaceous.
Location: Little Bear's village, between Fort Pierre and Fort Clark, Nebr.

—— latus (Mantell) Roemer. (1849.)

Tex , pp. 401, 402. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford and waterfall near New Braunfels, Tex.

—— latus (Mantell) Roemer. (1852.)

Kreide von Tex., p. 60. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, Tex.

—— lerouxi n. s. Marcou. (1858.)

Geol. N. Am., pp. 36, 37, pl. 2, fig. 3. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Ravines along the Rio Galisteo, N. Mex., precisely at the point where the road from Santa Fe to Algodones crosses the Rio.

—— lucifer n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 194, 195, Taf. 18, figs. 5–7. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: South coast of Tukusitnu bay, Alaska.

—— moresbyensis nom. prov. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 240, 241, fig. 11, p. 240. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet, Moresby island.

Inoceramus—Continued.

—— **mytiloides** (Mantell) Roemer. (1849.)
Tex., p. 401. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford and waterfall near New Braunfels, Tex.

—— **mytiloides** (Mantell) Roemer. (1852.)
Kreide von Tex., p. 60, Taf. 7, figs. 5. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford and waterfall of the Guadalupe, near New Braunfels, Tex.

—— **mytilopsis** n. s. Conrad. (1854.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 152, pl. 5, figs. 6*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: [Texas.]

—— **mytilopsis** (Con.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 169, 170, pl. 20, fig. 3. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo and Valdez inlet; Trent river, Vancouver island above the falls; Bradley creek.

—— **nebrascensis** n. s. Owen. (1852.)
Rep. Geol. Sur. Wis., Iowa, Minn., p. 582, pl. 8, fig. 1. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Sage Creek, Nebr.

—— **nebrascensis** var. **sagensis** —— Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 172. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo and Valdez inlet, Sucia islands.

—— ? **obliquus** n. s. Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 47, pl. 7, figs. 2, 2*a*. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

—— **oblongus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 181. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Vicinity of Morrison, Colo.

—— **oblongus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— **oblongus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 285, 286, pl. 2, figs. 1, *a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fifteen miles west of Greeley, and six miles south of Fort Collins, Colo.

Inoceramus—Continued.

—— **peculiaris** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 43, pl. 1, fig. 13. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **peculiaris** Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 76. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.

—— **perovalis** n. s. Conrad. (1852.)
Proc. Acad. Nat. Sci., Phila., vol. 6, 1852, 1853, p. 200. Phila., 1854. T. A. Conrad.
Formation: Cretaceous.
Location: Chesapeake & Delaware canal.

—— **perovalis** Conrad. (1854.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 299, pl. 27, fig. 7. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Chesapeake & Delaware canal.

—— **perovalis** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 80, pl. 15, figs. 6. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey (?)

—— **perplexus** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur., Rocky Mt. region. Prelim. Rep. Paleont., Black Hills, p. 31. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Belle Fourche, about ten miles west of Crow peak, Black hills, Dak.

—— **perplexus** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 392, pl. 8, fig. 3, and pl. 10, figs. 4, 5. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Belle Fourche about ten miles west of Crow peak, Black hills, Dak.

—— **pertenius** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 276, 277. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **pertentuis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 205, 206. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colo.

—— **piochii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 187, 188, pl. 25, figs. 173, 174. Phila, 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North side of Mount Diablo, Tuscan springs, Cal.

—— **porrectus** n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 191, 192, Taf. 19, figs. 1, 2. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Entrance to Tukusitnu bay, Alaska.

Inoceramus—Continued.

—— **problematicus** (Schlot.) Meek. (1860.)

Rep. Expl. Great Basin Terr., Utah, pp. 358, 359, pl. 4, figs. 1*a*, *b*, *c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Bear river, near the mouth of Sulphur creek, Wyo.

—— **problematicus** (d'Orb) Newberry. (1861.)

Rep. Colorado river of the West, pt. 3, p. 119. Wash., 1861. J. S. Newberry.
Formation: Cretaceous.
Location: At the crossing of Red fork of the Canadian, on the Santa Fe road.

—— **problematicus** (Schlot. op.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, pp. 177, 178, pl. 16, fig. 3*a*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah, and also upon the west fork of Paria creek, Utah.

—— **problematicus** (Schlot. ?) Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 143, 144, pl. 13, figs. 2, 2*a*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Sulphur creek, on Bear river, Wyo.

—— **problematicus** (Schlot.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— **problematicus** (Schlot.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **problematicus ?** (Schlot.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 389, 390, pl. 7, fig. 11. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the east fork of Beaver creek, Black hills.

—— **problematicus** (Schlot.) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 193, 194. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skidegate inlet, shore between Slate Chuck brook and Lina island; point north of Lina island in Bear Skin bay; Graham island, near Cowgitz.

Inoceramus—Continued.

—— **problematicus** (Schlot.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 85. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Mill creek, at mill west of Fort McLeod, Canada.

—— **problematicus ?** (Schlot.) Hill. (1889.)

Geol. Sur. Tex., Bull. No. 4, p. 9. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Near Austin, Tex.

—— **problematicus** (Schlot.) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 2, pp. 187, 188. Montreal, 1889 J. F. Whiteaves.
Formation: Cretaceous.
Location: Swan river and Thunder hill; Vermilion river, Riding mountain, section 7, township 24, range 20 west; Ochre river, township 22, range 17 west; Edwards creek, township 23, range 19 west; Vermilion river, township 25, range 20 west; Wilson river, township 25, range 21 west; Valley river, township 25, range 21 west, range 22 west in the same township; Rolling river two miles above the old C. P. R. crossing; Thunder hill, township 35, range 30, west. Manitoba.

—— **pro-obliquus** n. s. Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 80, 81, pl. 14, fig. 17. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, N. J.

—— **pseudomytiloides** n. s. Schiel. (1855.)

Rep. Expl. and Sur. P. R. R. Mississippi river to Pacific ocean, vol. 2; Rep. Expl. Forty-first Parallel, N. lat., p. 108, pl. 3, fig. 8. Wash., 1855. James Schiel.
Formation: Cretaceous.
Location: West of Fort Atkinson.

—— **quatsinoensis** n. s. Whiteaves. (1882.)

Proc. and Trans. Roy. Soc. Can., vol. 1, sec. 4, p. 84, fig. 3. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Forward inlet, Quatsino sound, Canada.

—— (?) **rectangulus** n. s. Meek. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 47, 48, pl. 7, figs. 1–1*a*. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

—— **sagensis** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., p. 582, pl. 8, fig. 3. Phila., 1852. D. D. Owen.
Formation: Cretaceous.
Location: Sage creek, southern tributary of the Cheyenne.

Inoceramus—Continued.

—— **sagensis** (Owen) Marcou. (1853.)

Geol. Map. of the U. S. and British Provinces of N. A., pp. 46, 47, pl. 7, fig. 6. Boston, 1853. Jules Marcou.

Formation: Cretaceous.

Location: Sage creek, Nebr.

—— **sagensis** (Owen) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 393, 395, pl. 7, fig. 12; pl. 8. fig. 2. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near Rapid creek; also at the top of the gray shales at the mouth of Rapid creek, Black hills.

—— **sagensis** (Owen) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 76, 78, pl. 14, fig. 15; pl. 15, figs. 1, 2. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Holmdel; New Egypt; Freehold; Keyport, N. J.

—— **sagensis** var. **nebrascensis** (Owen) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 34. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: St. Mary river, about ten miles from its mouth; South Saskatchewan, opposite Swift Current creek, Canada.

—— **sagensis** var. **nebrascensis** (Owen) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 174. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Mouth of Vermilion river, township 54, range 3, west of the fourth principal meridian; North Saskatchewan river, township 54, range 2, west of the fourth principal meridian; Nose creek, section 24, township 44, range 2, west of the fourth principal meridian, Northwest Territory.

—— **sagensis** var. **quadrans** n. var. Whitfield. (1884.)

Mong. U. S. Geol. Sur., vol. 9, p. 79, pl. 14, fig. 16. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Near Burlington, N. J.

—— **senseni** n. s. Conrad. (1852.)

Proc. Acad. Nat. Sci., Phila., vol. 6, 1852, 1853, p. 200. Phila., 1854 T. A. Conrad.

Formation: Cretaceous.

Location: Missouri river, Nebr.

—— **simpsoni** n. s. Meek. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 312. Phila., 1861. F. B. Meek.

Formation: Cretaceous.

Location: North Platte, above the bridge, Nebr.

—— **simpsoni** Meek. (1876.)

Rep. Expl. Great Basin Terr., Utah, p. 360, pl. 4, fig. 4. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: North Platte, above the bridge.

—— **simpsoni** Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 142, 143, pl. 13, fig. 3. Wash., 1877. F. B. Meek.

Formation: Cretaceous.

Location: North Platte river, above Platte bridge, in Dakota.

—— **simpsoni** (Meek) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 395, 396, pl. 8, fig. 1. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: Old Womans fork; east fork of Beaver creek, three miles west of Camp Jenney, Black hills.

—— **striatus** (Mantell) Roemer. (1849.)

Tex., p. 402. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall, near New Braunfels, Tex.

—— **striatus** (Mantell) Roemer. (1852.)

Kreide von Tex., p. 60. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of the Guadalupe, below New Braunfels, Tex.

—— **subcompressus** n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 181. Phila., 1861. Meek & Hayden.

Formation: Cretaceous.

Location: Mouth of Judith river, Nebr.

—— **sublævis** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 386, pl. 2, fig. 1*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: Great bend of the Missouri.

—— **sublævis** (H. & M.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 393, pl. 10, figs. 1–3. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: At the forks of the Cheyenne; and about three miles east of Camp Jenney, Redwater valley, Black hills.

—— **subundatus** n. s Meek. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 315. Phila., 1862. F. B. Meek.

Formation: Cretaceous.

Location: Komooks, eastern shore of Vancouver island.

—— **subquadratus** n. s. Schlüter. (1887.)

Verhandl. Naturhist. Vereines, preuss. Rheinlandhr, 44 Johrg. 1 Hälfte. Bonn, 1887. Sitzungsb, pp. 43–44. C. Schlüter.

Formation: Cretaceous.

Location: Near Austin, Tex.

—— **tenuilineatus** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol 5, n. s., p. 387, pl. 2, figs. 3*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: Sage creek and Great bend of the Missouri.

Inoceramus—Continued.

—— **tenuilineatus** (H. & M.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 400, 401, pl. 9, figs. 12, 13. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near Rapid creek, Black hills, Dak.

—— **tenuilineatus** (H. & M.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 34, pl. 5, figs. 1, 1*a*. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Blood Indian creek, longitude 110° W., also elbow of the South Saskatchewan river, Canada.

—— **tenuirostratus** n. s. M. & H. (1862.)

Proc. Acad. Nat. Sci., Phila., for 1862, p. 27. Phila., 1863. Meek & Hayden.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Missouri river.

—— **texanus** n. s. Conrad. (1854.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 152, pl. 5, fig. 7. T. A. Conrad.

Formation: Cretaceous.

Location: Western Texas.

—— **tippanus** (Con. sp.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 312. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

—— **umbonatus** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 50. Phila., 1859. Meek & Hayden.

Formation: Cretaceous.

Location: Near Fort Benton, on the Upper Missouri.

—— **undabundus** n. s. M. & H. (1862.)

Proc. Acad. Nat. Sci., Phila., for 1862, p. 26. Phila., 1863. Meek & Hayden.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Missouri river.

—— **undabundus** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 84. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Highwood river, ten miles west of the first fork; northwest branch of north fork of the Old Man river, about four miles below the mouth of Oyster creek, Canada.

—— **undulato-plicatus** n. s. Roemer. (1849.)

Tex., p. 402. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall near New Braunfels, Tex.

—— **undulato-plicatus** Roemer. (1852.)

Kreide von Tex., p. 59, Taf. 7, fig. 1. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of the Guadalupe below New Braunfels, Tex.

Inoceramus—Continued.

—— **undulato-plicatus** (Roemer) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 168, 169, pl. 20, figs. 2, 2*a*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nanaimo and Valdez inlet, Sable river, Vancouver island; Blunden point and Northwest bay, Vancouver island.

—— **vancouverensis** n. s. Shumard. (1858.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 122, 123. St. Louis, 1856–1860. B. F. Shumard.

Formation: Cretaceous.

Location: Nanaimo river, Vancouver island.

—— **vancouverensis** (Shum.) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 170–172, pl. 20, figs. 4, 4*a*, *b*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nanaimo river, two miles and a quarter up; Protection and Satuma islands; Vesuvius bay, on Salt spring or Admiralty island, Sucia islands.

—— **vancouverensis** (Shumard) White. (1889.)

Bull. U. S. Geol. Sur. No. 51, pp. 37, 38. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Sucia and Sheep Jack islands.

—— **vanuxemi** n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 180. Phila., 1861. Meek & Hayden.

Formation: Cretaceous.

Location: White river, above the Bad lands, Nebr.

—— **vanuxemi** (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 181. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Fossil ridge, Colo.

—— **vanuxemi** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 396–398, pl. 7, figs. 8, 9; pl. 8, figs. 4, 5. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near Rapid creek; on Old Woman fork, and at top of gray shales, near mouth of Rapid creek, Black hills.

—— **vanuxemi** (M. & H. ?) Stanton. (1887.)

Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 185. [Denver, 1888.] T. W. Stanton.

Formation: Cretaceous.

Location: About five miles north of the town of Boulder, Colo.

Inoceramus—Continued.

—— **vanuxemi** (M. & H.) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 175. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Mouth of Vermilion river, township 54, range 3, west of the fourth principal meridian; North Saskatchewan river, township 54, range 2, west of the same meridian, Northwest Territory.

—— **vanuxemi** var.? Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 398, pl. 7, fig. 10. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek, Black hills, Dak.

—— **ventricosus** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 87. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **whitneyi** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 193, 194, pl. 32, fig. 91. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Near Folsom, Cal.

—— (**Actinoceramus**) **sulcatus** (Park.) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 241, 242, pl. 32, figs. 3, 3*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: At and around Bear Skin bay, on Graham island, side of Skidegate inlet.

—— [**Aucella**] **piochii** (Gabb) White. (1888.)

Mong. U. S. Geol. Sur., vol. 13, pp. 226–232, pl. 4, figs. 1, 2. Wash., 1888. C. A. White.
Formation: Cretaceous.

—— (**Catillus**) **balchii** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 56, pl. 15, figs, 1*a*, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth; Deer creek, a tributary of the North Platte.

—— (**Catillus**) **convexus** (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 51, 52, pl. 12, figs. 5*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri, below Fort Pierre.

—— (**Catillus**) **cripsii** var. **subcompressus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 48, 49, pl. 38, fig. 2, bis. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, above Fort Union.

Inoceramus—Continued.

—— (**Catillus**) **cripsii** var. **barabini** (Mort.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 49–51, pl. 13, figs. 1*a*–*c*, pl. 12, fig. 3. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth, in Montana.

—— (**Catillus**) **incurvus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 61, pl. 12, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Little Bear's village, between Fort Pierre and Fort Clark.

—— (**Catillus**) **pertenuis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 47, 48, pl. 37, figs. 3*a*, *b*, pl. 38, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, above Fort Union.

—— (**Catillus**) **proximus** (Tuomey) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 53–55, pl. 12, figs. 7*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri, below Fort Pierre.

—— (**Catillus**) **proximus**? var. **subcircularis** n. var. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 55, 56, pl. 12, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth; Deer creek, a tributary of the North Platte.

—— (**Catillus**) **sublævis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 58, 59, pl. 12, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri, below Fort Pierre.

—— (**Catillus**) **tenuilineatus** (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 57, pl. 12, fig. 6. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri; Sage creek.

—— (**Catillus**) **tenuirostris** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 59, fig. 5. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Chippewa point, Mont.

—— (**Catillus**) **undabundus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 60, 61, pl. 3, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Chippewa point on the Missouri, near Fort Benton.

Inoceramus—Continued.

—— (Catillus) vanuxemi (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 57, 58, pl. 14, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri; Sage creek.

—— (Inoceramus) altus Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 43, 44, pl. 14, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Medicine Bow station, Wyo.

—— (Inoceramus) fragilis (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 42, 43, pl. 5, fig. 5, figs. 1, 2, p. 42. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the mouth of Vermilion river, on the Missouri; near Fort Benton, Mont.

—— (Mytiloides) problematicus (Schlot.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 62, pl. 9, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Big Sioux river, six miles above its mouth; on Little Blue river, near Kansas and Nebraska line, and at many other localities in that region; also at Coalville, Utah, Fort Harker, Mont., as well as in Wyoming, Colorado, Arkansas, and southward into Texas.

—— (Mytiloides) problematicus var. aviculoides (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 63, 64, pl. 9, fig. 4. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Little Blue river, near the Kansas and Nebraska line; near Big Blue river in Nebraska; on Republican river, Kans.

—— (Volviceramus) exogyroides (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 46, 47, pl. 5, figs. 3*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Chippewa point, near Fort Benton.

—— (Volviceramus) umbonatus (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 44–46, pl. 3, figs. 1*a*, *b*, pl. 4, figs. 1*a*, *b*, and 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twenty miles below Fort Benton, on the Upper Missouri.

—— —— ? Hall. (1845.)

Rep. Expl. Exped. Rocky Mts., Oreg., and North Cal., Fremont, pp. 309, 310, pl. 4, figs. 1, 1*a*. Wash., 1845. James Hall.
Formation: Cretaceous.
Location: Smoky hill river, long. 98°, lat. 38°.

—— —— ? Hall. (1845.)

Rep. Expl. Exped. Rocky Mts., Oreg., and North Cal., Fremont, p. 310, pl. 4, fig. 2. Wash., 1845. James Hall.
Formation: Cretaceous.
Location: Near the eastern slope of the Rocky mountains, in long. 105°, lat. 39°.

Inoceramus—Continued.

—— sp. undet. Bailey.

Rep. Lieut. J. W. Abert, Exam. N. Mex., 1846 and 1847, Ex. Doc. No. 41, p. 547, [pl. 2], fig. 1. [No imprint.] J. W. Bailey.
Formation: Cretaceous.
Location: Rio Timpa, lat. 37° 41′, long. 104° 07′.

—— sp. undet. Schiel. (1854.)

Rep. Expl. and Sur. P. R. R., Mississippi river to Pacific ocean, vol. 2; Rep. Expl. Forty-first Parallel N. Lat., p. 108, pl. 2, fig. 6. Wash., 1855. James Schiel.
Formation: Cretaceous.
Location: Near Fort Atkinson.

—— sp. undet. Owen. (1860.)

Second Rep. Geol. Rec. Ark., pl. 7, fig. 1. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— sp. undet. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Between Denver and Cheyenne.

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Six miles east of Como station, U. P. R. R. [Wyo.].

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Medicine Bow station [Wyo.].

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Miser station, U. P. R. R. [Wyo.].

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Fountain creek, Colorado city, Colo.

—— sp. undet. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Fountain creek, Colorado city, Colo.

—— sp. undet. Meek. (1870.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 144, pl. 13, figs. 4, 4*a*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: On Sulphur creek, near Bear river, Wyo.

—— sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-quarter and two and one-half miles up.

Inoceramus—Continued.

—— sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, ten miles up.

—— sp. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 264. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island.

—— —— (?) Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 359, pl. 1, fig. 6. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— —— (?) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–1877, p. 152. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Falls of the Iltasyouco river, British Columbia.

—— —— (?) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 403. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Falls of the Iltasyouco river.

—— —— (?) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— sp. undet. Ramirez. (1880.)
An. Min. Fomento Rep., Mex., Tomo 3, p. 656, Lam. 1, fig. 3. Mexico, 1880. S. Ramirez.
Formation: Cretaceous.
Location: Sierra Mojada, Mexico.

—— —— Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 167. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devils lake, Northwest Territory.

Inoperna n. g. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1876. W. C. Kerr. App. A, p. 5. T. A. Conrad.

—— carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 5, pl. 1, fig. 22. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

Irihea (subgen. Swain) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Isocardia (Lam.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 393. Phila., 1858–1860. W. M. Gabb.

—— conradi n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 393, pl. 68, fig. 21. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Prairie bluff, Ala., and Timber creek, N. J.

—— conradi (Gabb) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 200, 201, pl. 26, figs. 3, 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Timber creek, N. J. ?

—— ? hodgei n. s. Meek. (1871.)
Proc. Acad. Nat. Sci., Phila., for 1871, pp. 183, 184. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Band of iron ore that extends along the Upper Missouri for some distance, near the Great bend.

—— washita n. s. Marcou. (1858.)
Geol. N. Am., p. 37, pl. 3, figs. 2, 2*a*, *b*. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Borders of Red river, near Preston, Tex.

—— sp. undet. Roemer. 1849.
Tex., p. 405. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 50. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 50. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

Isopleura n. g. Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 36. Wash., 1864. F. B. Meek.

—— curvilirata Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 36. Wash., 1864.
Formation: Cretaceous.
Location: Mississippi.

—— curvilirata (Conrad.) Gabb. (1868.)
Am. Jour. Conch., vol. 4, p. 142, pl. 13, fig. 7. Phila., 1868. W. M. Gabb.
Formation: Cretaceous.

Janira (Schum.) Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol., 1856–1860, p. 607. St. Louis, 1856–1860. B. F. Shumard.

Janira—Continued.

—— **foveolata** n. s. Eichwald. (1871.)
Geognost. Paleont. Bemerk. Halb. Mang. aleutchen Inseln, pp. 197–199, Taf. 20, figs. 6–8. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **wrightii** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 607. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Shoal creek, near Austin, Tex.

Kellia (Turton) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 280. Phila., 1858–1860. T. A. Conrad.

—— **cretacea** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 280, pl. 46, fig. 19. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

Lævicardium (subgen. Swains.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 326. Phila., 1855–1858. T. A. Conrad.

—— **sucieuse** n. s. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 154, 155, pl. 18, fig. 2, Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

Lagena (subgen. H. & A. Ad.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 281. Phila., 1876. W. M. Gabb.

Lampsilis (subgen. Raf.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Lanieria lanieri (d'Orb.) Cotteau. (1890.)
Bull. Soc. Geol. France, 3d ser., vol. 18, pp. 298, 299. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: San Luis, Mexico.

—— **lanieri** (d'Orb.) (Duncan) Cotteau. (1890.)
Bull. Soc. Geol. France, 3d ser., vol. 18, No. 4, pp. 298, 299. Paris, 1880. Cotteau.
Formation: Cretaceous.
Location: San Luis.

Latiarca Conrad. (1875.)
Rep. Geol. Sur., N. C. vol. 1, Raleigh, 1875. W. C. Kerr. App. A, p. 28. T. A. Conrad.

—— (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 84. Wash., 1876. F. B. Meek.

Laxispira n. g. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 301. Phila., 1876. W. M. Gabb.

Laxispira—Continued.

—— **lumbricalis** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 301, 302, pl. 17, figs. 6 and 7. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Leda (Schum.) Meek. (1859.)
Northwest Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 183. Toronto, 1859. F. B. Meek.

—— **angulata** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 35. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **bisulcata** n. s. M. & H. (1861.)
Proc. Acad. Nat Sci., Phila., for 1861, p. 449. Phila., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Deer Creek, near north branch Platte river, Nebr.

—— **evansi** (M. & H.) Meek. (1859.)
Northwest Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 184. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: South branch of the Saskatchewan, Canada.

—— **fibrosa** n. s. E. & S. (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 39, 40. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Sage creek, Nebr. terr.

—— **gabbii** (Con. sp.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 197, 198. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— **hindi** n. s. Meek. (1859.)
Northwest Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 183, pl. 1, figs. 8, 9. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: Little Souris river, Canada.

—— **longifrons** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 281, 282, pl. 46, fig. 18. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **pinnaforma** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 303, pl. 48, fig. 23. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington, county, N. J.

—— **protexta** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 303, pl. 48, fig. 24. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington and Gloucester counties, N. J.

Leda—Continued.

—— **protexta** Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 397, pl. 68, fig. 35. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tenn.

—— **protexta** ? Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 199, pl. 26, fig. 185. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: From Clayton to Marsh's, Martinez, San Diego, Alizos creek, near Canada de las Uvas, and in the San Emidio canyon, near the same place, Cal.

—— **slackiana** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 397, pl. 69, fig. 36. Phila., 1858-1870. W. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, N. J.

Legumen n. g. Conrad. (1858)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 325. Phila., 1855-1858. T. A. Conrad.

—— **appressum** (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 185, 186, pl. 25, figs. 6-8. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **appressus** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 325. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **ellipticus** n. s. Conrad. (1858)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1852-1858, p. 325, pl. 34, fig. 19. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **planulatum** (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 184, 185, pl. 25, figs. 3, 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold, and from the marl pits of G. C. Schancks, Monmouth county, N. J.

—— **planulatus** Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 277. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Alabama and New Jersey.

—— **planulatus** (Con. sp.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, pp. 304, 305. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Leioderma (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 292. Phila., 1876. W. M. Gabb.

—— **canalis** (Conn. sp.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 292. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Clay county, Ga.

Leiopistha (Meek) White. (1874.)

Prelim. Rep. Invert. Foss., Geogr. and Geol. Expl. and Sur., west of one hundredth meridian, p. 26. Wash., 1874. C. A. White.

—— **elegantula** (Roem.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 141, 142. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey. ?

—— **inflata** n. s. Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 142, pl. 20, figs. 4, 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, N. J.

—— **protexta** (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 140. 141, pl. 20, figs. 1-3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel and Burlington, N. J.

—— (**Cymella**) **meeki** Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 418, 419, pl. 11, figs. 27, 28. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Deadmans rapids, Upper Missouri.

—— (**Cymella**) **undata** (M. & H. sp.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, p. 187, pl. 18, fig. 15*a*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Gallinas creek, N. Mex.

—— (**Psilomya**) **meekii** n. s. White. (1874.)

Prelim. Rep. Invert. Foss., Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, p. 26. Wash., 1874. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

—— (**Psilomya**) **meekii** White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, pp. 186, 187, pl. 18, figs. 14*a-d*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

Leioplax (Troschel) White. (1876.)

Rep. Geol. Uinta Mts., p. 133. Wash., 1876. C. A. White.

—— ? **turricula** n. s. White. (1876.)

Rep. Geol. Uinta Mts, pp. 133, 134. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

Leptæna n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, pp. 307, 308. Phila., 1858-1860. W. M. Gabb.
Formation: Triassic?
Location: Bath county, Va.

Leptesthes subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 523. Wash., 1876. F. B. Meek.

Leptocardia subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 172. Wash., 1876. F. B. Meek.

Leptomya n. g. Conrad. (1867.)
Am. Jour. Conch., vol. 3, p. 15. Phila., 1867. T. A. Conrad.

—— **applicata Conrad.** (1867.)
Am. Jour. Conch., vol. 3, p. 15. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.

Leptosolen n. subgen. Con. (1865.)
Proc. Acad. Nat. Sci., Phila., for 1865, p. 184. Phila., 1865. T. A. Conrad.

—— **n. g. Conrad.** (1867.)
Am. Jour. Conch., vol. 3, p. 15. Phila., 1867. T. A. Conrad.

—— **biplicata Con.** (1867.)
Am. Jour. Conch., vol. 3, pp. 15, 16. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.
Location: North Mississippi.

—— **biplicata (Con.) Gabb.** (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 304. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Clay county, Ga.

—— **biplicata (Con.) Whitfield.** (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 183, 184, pl. 25, figs. 1, 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Rev. G. C. Schancks, near Marlboro, N. J.

—— **conradi n. s. Meek.** (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 311, 312. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

—— **conradi Meek.** (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 253, 254, pl. 2, figs. 12*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

Lima [Brug.] Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 151. Wash., 1857. T. A. Conrad.

—— **appressa n. s. Gabb.** (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 203, pl. 31, fig. 271. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: San Luis, Gonzaga ranch, Cal.

Lima—Continued.

—— **crenulicosta n. s. Roemer.** (1849.)
Tex., p. 399. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— **crenulicosta Roemer.** (1852.)
Kreide von Tex., p. 63, Taf. 8, figs. 8*a*-*c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— **? cuneata n. s. Meek.** (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 44, 45, pl. 7, figs. 6, 6*a*. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

—— **duplicata (Sow.) Whiteaves.** (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 402. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake.

—— **duplicata (Sow. sp.) Whiteaves.** (1878.)
Geol. Sur. Can., Rep. Prog. for 1876-1877, p. 152. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake, British Columbia.

—— **erringtoni n. s. Gabb.** (1864.)
Proc. Cal. Acad. Nat. Sci., vol. 3, p. 173. San Francisco, 1863-1868. W. M. Gabb.
Formation: Jurassic [Cretaceous?].
Location: Mariposa estate, Mariposa county, Cal.

—— **glabra n. s. Eichwald.** (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 196, Taf. 16, figs. 25, 26. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **kimballi n. s. Gabb.** (1872.)
Proc. Acad. Nat. Sci., Phila., for 1872, p. 264, 265, pl. 11, fig. 1. Phila., 1872. W. M. Gabb.
Formation: Cretaceous.
Location: Nugal, near the center of the state of Chihuahua, Mexico.

—— **leonensis n. s. Conrad.** (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 151, pl. 5, figs. 3*a*-*c*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon springs [Tex.].

—— **microtis n. s. Gabb.** (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 202, pl. 25, fig. 189. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Cal.

—— **multiradiata n. s. Gabb.** (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 201, 202, pl. 33, fig. 101. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Vicinity of lower lake village, Lake county, Cal.

ma—Continued.

— multiradiata? (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 174. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Entrance to Departure bay.

— perobliqua n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 165, pl. 22, figs. 3, 3a. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rock mountains, three miles north of the east end of Devils lake, Northwest Territory.

— punctum n. s. Eichwald. (1871.)
Geog. Paleont. Bemer. Halb. Mang. aleutischen, Inseln, p. 197, Taf. 16, figs. 23, 24. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

— recticostata n. s. Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 44, pl. 7, fig. 5. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

— reticulata n. s. Forbes. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, p. 62, figs. —, p. 62. London, 1845. Edward Forbes.
Formation: Cretaceous.
Location: New Jersey.

— shastaensis n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 201, pl. 33, fig. 100. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

— ? sinuata n. s. Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 43, pl. 7, figs. 4, 4a. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

— wacoensis n. s. Roemer. (1849.)
Tex., pp. 399, 400. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: [Waco camp, near New Braunfels] Tex.

— wacoensis Roemer. (1852.)
Kreide von Tex., pp. 63, 64, Taf. 8, figs. 7a, b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, on the Guadalupe, above New Braunfels, Tex.

— wacoensis (Roem.) Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 151, pl. 5, figs. 4a, b. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: [Texas.]

— wacoensis (Roem.) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 176, 177, pl. 17, figs. 4a–c. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

Lima—Continued.

—— (Limatula) erecta n. s. Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 130, pl. 12, fig. 2. Wash., 1877. F. B. Meek.
Formation: Jurassic.
Location: New Pass, Desatoya mountains, Nev.

—— (Plagiostoma) occidentalis n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 292, 293, pl. 7, fig. 23. Wash., 1807. Hall & Whitfield.
Formation: Jurassic.
Location: Flaming gorge, Uinta range, Utah.

—— (Plagiostoma) sp. undet. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 15. Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Mormon station, Plumas county, Cal.

—— sp. undet. Whiteaves. (1884.)
Geol. and Nat. His. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 251. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

Limnæa (Lam.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 531–533. Wash., 1876. F. B. Meek.

—— (Lam. typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 532. Wash., 1876. F. B. Meek.

—— ? accelerata n. s. White. (1886.)
Bull. U. S. Geol. Sur., No. 29, pp. 20, 21, pl. 4, figs. 12–15. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

—— ativuncula n. s. White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 20, pl. 4, figs. 10, 11. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

—— ? compactilis (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 39, pl. 26, fig. 14. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Separation station, southern Wyoming.

—— consortis n. s. White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 20, pl. 4, figs. 8, 9. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

Limnæa nitidula Meek. (1876.)
Rep. Expl. Great Basin Terr., Utah, pp. 363, 364, pl. 5, fig. 14. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Mouth of Sulphur creek, Wyo.

—— nitidula (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Mellis station, Wyo.

Limnæa—Continued.

—— **nitidula (Meek) White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 84. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near mouth of Sulphur creek, Wyo.

—— **tenuicostata (M. & H.) Whiteaves. (1885.)**
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 13. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Mouth of the Blind Man river, township 39, range, 27, west of fourth principal meridian, Canada.

—— **(Acella) haldemani White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 39, pl. 6, figs. 18, 19. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming.

—— **(Limnophysa ?) compactilis n. s. Meek. (1873.)**
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 517. Wash., 1873. F. B. Meek.
Formation: Tertiary [Cretaceous]:
Location: Separation on the Union Pacific railroad [Wyo.].

—— **(Limnophysa) nitidula Meek. (1877.)**
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 181, 182, pl. 17, figs. 5, 5a. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Sulphur creek, on Bear river, Wyo.

—— **(Limnophysa) nitidula (Meek) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 39, pl. 6, figs. 15, 16. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming.

—— **(Pleurolimnæa) tenuicostata (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 534, pl. 44, figs. 13*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Tertiary. [Cretaceous.]
Location: Three miles below Fort Union.

—— **(Pleurolimnæa) tenuicostata (M. & H.) White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., Part 1, p. 84. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Fort Union, in the Upper Missouri river region.

—— **tenuicostata n. s. M. & H. (1856.)**
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 119. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union.

—— **(Pleurolimnæa) tenuicostata (M. & H.) White. (1883.)**
Third Ann. Rep. U. S. Geol. Sur., p. 39, pl. 23, fig. 24. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: [Near Fort Union.]

Limnophysa (subgen. Fitzinger) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 533. Wash., 1876. F. B. Meek.

Limopsis (Sassi) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 200. Phila., 1864. W. M. Gabb.

—— **parvula (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 97, 98, pl. 28, figs. 17*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth.

—— **striata-punctatus n. s. E. & S. (1857.)**
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 38. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Moreau and Grand rivers, Nebr.

—— **transversa n. s. Gabb. (1864.)**
Geol. Sur. Cal. Paleont., vol. 1, p. 200, pl. 26, fig. 186. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

Linearia n. g. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 279. Phila., 1858–1860. T. A. Conrad.

—— **contracta n. s. Whitfield. (1885.)**
Mong. U. S. Geol. Sur., vol. 9, p. 167, pl. 23, fig. 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, N. J.

—— **? formosa (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 199, 200, pl. 30, fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twenty miles below the mouth of Cannon ball river.

—— **formosa ? (M. & H.) Whiteaves. (1889.)**
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 177, pl. 24, fig. 3. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sounding creek, township 30, range 8, west of the fourth principal meridian, Northwest Territory.

—— **metastriata n. s. Conrad. (1860.)**
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 279, 280, pl. 46, fig. 7. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **metastriata (Con.) Whitfield. (1885.)**
Mong. U. S. Geol. Sur., vol. 9, pp. 165, 166, pl. 23, figs. 6, 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel and Haddonfield, N. J.

Linearia—Continued.

—— **suciensis** n. s. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 146, 147, pl. 17, fig. 12. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— (**Leiothyris**) **meekana** Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 147. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— (**Liothyris**) **carolinensis** Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 9, pl. 1, fig. 26. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, pp. 73, 74, pl. 3, fig. 11. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.

Lingula (Brug.) M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 443. Phila., 1862. Meek & Hayden.

—— **brevirostris** n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, p. 50. Phila., 1859. Meek & Hayden.
Formation: Jurassic.
Location: Western and southwestern base of Black hills.

—— **brevirostris** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 69, pl. 3, figs. 3, *a*, *b*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills, Idaho Territory.

—— **brevirostris** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 246, 247, pl. 3, figs. 4, 5. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: On the east side of Spearfish creek, near its junction with the Redwater, Black hills, Dak.

—— **nitida** n. s. M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 443, 444, Phila., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth Big Horn river, Nebr.

—— **nitida** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 9, 10, pl. 28, figs. 18*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of the Big Horn river.

—— **nitida** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 205. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colo.

Lingula—Continued.

—— **nitida** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 29. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Three miles north of Ross coulee, near Irvine station, on the Canadian Pacific railway, Old Wives creek, Township 10, Range 11, west of third principal meridian, Canada.

—— **subspatulata** n. s. (H. & M.) (1854.)
Mem. Am. Acad. Arts and Sci., n. s., vol. 5, p. 380, pl. 1, figs. 2*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Near Red Cedar island, thirty-five miles below Fort Pierre.

—— **subspatulata** (H. & M.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.

—— **subspatulata** (H. & M.) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, p. 169, pl. 15, fig. 4*a*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Ten miles southeast of Old Fort Wingate, N. Mex.

—— **subspatulata** ? (H. & M.) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 185, 186. Montreal, 1889 J. F. Whiteaves.
Formation: Cretaceous.
Location: Rolling river, township 35, range 26, Manitoba.

Liocium n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 174. Phila., 1869. W. M. Gabb.

—— **punctatum** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 173, pl. 28, fig. 59. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: South of the road from Colusa to the Hot Sulphur springs in the first range of foot hills, Colusa county, Cal.

Lioderma n. g. Con. (1865.)
Proc. Acad. Nat. Sci., Phila., for 1865, p. 184. Phila., 1865. T. A. Conrad.

—— **lioderma** (Con. sp.) Con. (1865.)
Proc. Acad. Nat. Sci., Phila., for 1865, p. 184. Phila., 1865. T. A. Conrad.
Formation: [Cretaceous.]

—— **thoracica** n. s. Conrad. (1875)
Rep. Geol. Sur. N. C., vol. 1, Raleigh, 1875, W. C. Kerr. App. A, p. 13, pl. 2, fig. 30. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

Liopeplum n. g. Dall. (1890.)
Trans. Wag. Free Inst. Sci., Phila., vol. 3, p. 73. Phila., 1890. W. H. Dall.

—— spillmani (Tuomey sp.) Dall. (1890.)
Trans. Wag. Free Inst. Sci., Phila., vol. 3, pp. 82, 83, pl. 6, fig. 12. Phila., 1890. W. H. Dall.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— subjugosum (Gabb sp.) Dall. (1890.)
Trans. Wag. Free Inst. Sci., Phila., vol. 3, p. 83, pl. 6, fig. 12*a*. Phila., 1890. W. H. Dall.
Formation: Cretaceous.
Location: Tippah county, Miss.

Liopistha n. g. Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, pp. 32, 33. Wash., 1864. F. B. Meek.

—— (Meek) White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, G. M. Wheeler, p. 26. Wash., 1874. C. A. White.

——(Meek, typical.) (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 229. Wash., 1876. F. B. Meek.

——? elegantulum (Roem.) Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, pp. 32, 33. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Texas.

—— protexta Conrad. (1875.)
Rep. Geol. Sur., N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 28. T. A. Conrad.
Formation: Cretaceous.
Location: Ripley, Miss.

—— protexta (Con.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 227, figs. 24–24, p. 227. Wash., 1876. F. B. Meek.
Formation: Cretaceous.

—— undata (M. & H.) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 178. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nose creek, township 37, range 9, west of the fourth principal meridian, Northwest Territory.

——(Cymella) bella (Con.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 228, figs. 25–30, p. 228. Wash., 1876. F. B. Meek.
Formation: Cretaceous.

—— (Cymella) meekii n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region, Prelim. Rep. Paleont. Black Hills, pp. 35, 36. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: Dead Mans rapids, upper Missouri.

Liopistha—Continued.

—— (Cymella) undata (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 236, 237, pl., 39, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, on the upper Missouri, in Idaho Terr.

——(Cymella) undata (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 43, 44. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: St. Mary river, near its junction with the Belly river; South Saskatchewan, opposite mouth of Swift Current creek; Bulls Head, about twenty-two miles west of the west end of the Cypress hills; Berry creek, township 25, range 12, and four miles south of Battle river, township 38, between ranges 12 and 13, both west of fourth meridian; three miles north of Ross coulee, near Irvine station, on the Canadian Pacific railway, Canada.

—— (Cymella) undata (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 80. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Milk river, four miles east of MacLeod Benton trail, Canada.

—— (Psilomya) meekii n. s. White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, G. M. Wheeler, p. 26. Wash., 1874. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

Lioplacodes n. g. Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 40. Wash., 1864. F. B. Meek.

—— veterna (M. & H.) Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 40. Wash., 1864. F. B. Meek.
Formation: Jurassic.
Location: Idaho.

—— veternus (Meek) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 116, fig. 2, text. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Head of Wind river, Dak.

—— veternus (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 60, pl. 3, fig. 9. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Near Blacks hills.

Lioplacodes—Continued.

—— **veternus** (M. & H.) White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 23, pl. 4, fig. 18. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Black hills of Dak.

Liothyris n. subgen. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 9. T. A. Conrad.

Liroscapha n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 100. Phila., 1870. T. A. Conrad.

—— **squamosa** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 100, pl. 9, fig. 23. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Lispodesthes n. g. White. (1875.)
Rep. Geog. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, p. 191. Wash., 1875. C. A. White.

—— **lingulifera** n. s. White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, pp. 192, 193, pl. 18, figs. 2*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: East of Mount Taylor, one mile south of Pajuate, N. Mex.

—— **nuptialis** White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur., west of one-hundredth meridian, vol. 4, pt. 1, p. 192, pl. 18, figs. 3*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Fifty miles north of Camp Apache, five miles west of Mineral spring, Ariz.

—— ? **obscurata** n. s. White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 30, 31, pl. 11, figs. 7*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Dodson's ranch, near Pueblo, Colo.

Lithodomus sp. Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 233. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **affinis** (Gabb) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 66, 67, pl. 17, figs. 2, 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Burlington county, ? N. J.

—— **maudensis** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol 1, pt. 3, pp. 237, 238, pl. 32, figs. 6, 6*a*.
Formation: Cretaceous.
Location: East end of Maud island.

—— **maudensis** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 250. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

Lithodomus—Continued.

—— **ripleyana** (Gabb) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 67, 68, pl. 17, figs. 4, 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near New Egypt; Mr. Ware's pits near Mullica hill; and at Hunt's pits at Manalapan, Monmouth county, N. J.

Lithophaga (Bolt.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 311. Phila., 1876. W. M. Gabb.

—— **ripleyana** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 311, 312. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

Lithophagus (Muhlf.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 326. Phila., 1862. W. M. Gabb.

—— **affinis** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 327. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, ? N. J.

—— **oviformis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 185, pl. 25, fig. 168. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Crow creek, Shasta county, Cal.

—— **ripleyanus** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 326, 327. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Point where the West Jersey railroad crosses Big Timber creek, between Gloucester and Red bank, N. J.

Littorina (Ferussac) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 131. Phila., 1864. W. M. Gabb.

—— ? **compacta** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 131, pl. 20, fig. 89. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **compacta** (Gabb) Whiteaves (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 121. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Southwest side of Denman island.

Loricula canadensis n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 190, 191, pl. 26, figs. 4, 4*a*. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Duck river, township 34, range 23 west, Manitoba.

Loripes (Poli) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 177. Phila., 1864. W. M. Gabb.

Lorʹpes—Continued.

—— **dubia** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 177, pl. 24, figs. 170, 171. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Texas flat, Placer county; Chico creek, Butte county; Tuscan springs, Tehama county, Cal.

Loxotrema n. g. Gabb. (1868.)

Am. Jour. Conch., vol. 4, p. 147. Phila., 1868. W. M. Gabb.

—— **turrita** n. s. Gabb. (1868.)

Am. Jour. Conch., vol. 4, p. 147, pl. 14, fig. 21. Phila., 1868. W. M. Gabb.

Formation: Cretaceous.

Location: California.

—— **turrita** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 168, pl. 28, fig. 49. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Ten miles west of Griswold's, between San Juan and New Idria, Cal.

Lucina [Brug.] Conrad. (1853.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275. Phila., 1850–1854. T. A. Conrad.

—— (Brug. typical) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 130. Wash., 1876. F. B. Meek.

—— **acute lineolata** n. s. Roemer. (1888.)

Paleont. Abhandl. Vierter Band, Heft 4, p. 14, Taf. III [XXXIII], figs. 4*a*, 4*b*. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— **cleburni** n. s. White. (1881.)

Proc. U. S. Nat. Mus., vol. 4, p. 139, pl. 1, figs. 3 and 4. Wash., 1881. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

Formation: Cretaceous.

Location: Vicinity of Julesburg, Colo.

—— **cretacea** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 177, pl. 30, fig. 255. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: From Clayton to Marsh's, vicinity of Mount Diablo, Cal.

—— **cretacea** (Con.) Whitfield. (1884.)

Mong. U. S. Geol. Sur., vol. 9, pp. 129, 130, pl. 18, figs. 23–25. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **cumulata** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 176, pl. 24, fig. 254. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Near Fort Tejon, Cal.

—— **glebula** n. s. Conrad. (1875.)

Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 7, pl. 1, fig. 12. T. A. Conrad.

Formation: Cretaceous.

Location: Snow hill, Greene county, N. C.

Lucina—Continued.

—— **lenticularis** (Goldf.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 23 Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Middletown, N. J.

—— **nasuta** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 175, pl. 24, fig 158. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Near Martinez, Cal.

—— **nasuta** (Gabb) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 157. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Sucia islands; below Dodd narrows, Vancouver island.

—— **occidentalis** (Mort. sp. ?) M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, pp. 273, 274. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Near Milk river, and eighty miles above on the Missouri; also on the Yellowstone and Moreau rivers, Nebr.

—— **occidentalis** (Mort.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 134, 135, pl. 17, figs. 4*a–d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Milk river, and on Cheyenne river; also on Moreau river.

—— **occidentalis** (Mort.) Whitfield. (1880.)

Report Geol. Black Hills of Dak., pp. 409, 410, pl. 11, figs. 19–21. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On Cheyenne river, near Rapid creek, Black hills.

—— **occidentalis** (Morton) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 39. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Bull Pound creek, section 3, township 26, range 14, west of fourth principal meridian; Old Wives creek, township 10, range 11, west of fourth principal meridian, Canada.

—— **occidentalis** var. **ventricosa** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 135, 136, pl. 17. figs. 3*a*, *c*. Wash., 1876. F. B. Meek.

—— **parvilineata** n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 204. Boston, 1862. B. F. Shumard.

Formation: Cretaceous.

Location: Near Corsicana, Navarro county, Tex.

—— **pinguis** n. s. Conrad. (1853.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275, pl. 24, fig. 18. Phila., 1850–1854. T. A. Conrad.

Formation: Cretaceous.

Location: New Jersey. (?)

Lucina—Continued.

—— **postradiata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 175, 176, pl. 24, fig. 159. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **profunda** n. s. White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, pp. 158, 159. Wash., 1880. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous.
Location: Monument creek, Colo.

—— **profunda** White. (1881.)
Proc. U. S. Nat. Mus., vol. 4, p. 138, pl. 1, figs. 5, 6. Wash., 1881. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

—— **richardsonii** n. s. Whiteaves. (1874)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, ten miles up.

—— **richardsonii** Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 266, pl. —, fig. 1. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, ten miles up.

—— **smockana** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 130, 131, pl. 18, figs. 21, 22. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold, N. J.

—— **subcircularis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 176, pl. 24, fig. 160. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **subcircularis** ? (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 157. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **sublenticularis** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 602. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river in Lamar and Fannin counties, Tex.

—— **subundata** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 382, pl. 1, figs. 6*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek.

—— **subundata** (H. & M.) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, p. 184, pl. 18, fig. 12*a*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

Lucina—Continued.

—— **subundata** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 133, 134, pl. 17, figs. 2*a–e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Sage creek, on the Cheyenne.

—— **translucida** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 199, 200, pl. 30, fig. 269. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cow creek, Shasta county, Cal.

—— **ventricosa** (H. & M.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 410, 411, pl. 11, figs. 14–16. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek.

—— **(Diplodonta ?) subundata** (H. & M.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 411, 412, pl. 11, figs. 17, 18. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek, Black hills, Dak.

—— sp. undet. Roemer. (1849.)
Tex., p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— ? sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog., for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation : Cretaceous.
Location : Nanaimo river, Vancouver island, two and one-quarter and two and one-half miles up.

—— sp. undet. Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 61, 62, pl. 9, fig. 12, fig. 6, p. 61. Montreal, 1866. J. F. Whiteaves.
Formation : Cretaceous.
Location : Queen Charlotte island.

—— (?) sp. undet. Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 62, 63, fig. 7, p. 62. Montreal, 1876. J. F. Whiteaves.
Formation : Cretaceous.
Location : Queen Charlotte island.

—— —— ? White. (1878.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation : Cretaceous.
Location : Coalville, Utah.

Lunatia (subgen. Gray) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 334. Phila., 1855–1858. T. A. Conrad.

—— [Gray] Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 391. Phila., 1858–1860. W. M. Gabb.

—— **altispira** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 320. Phila., 1862. W. M. Gabb.
Formation : Cretaceous.
Location : Crosswicks, N. J.

Lunatia—Continued.

—— avellana n. s Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 105, 106, pl. 19, fig. 60. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, north fork, Cal.

—— carolinensis n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 13, pl. 2, fig. 29. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— concinna (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9. pp. 314, 315, pl. 32, figs. 11*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On Moreau river, in Dakota.

—— concinna (H. & M.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 430, pl. 12, fig. 13. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek.

—— concinna (H. & M.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 48. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Elbow of the South Saskatchewan, also Blood Indian creek, north of the Red Deer river, and twenty miles east of the Hand hills, Canada.

—— concinna (H. & M. sp.) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 181. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Battle river, township 46, range 3, west of the fourth principal meridian; Sounding creek, township 30, range 8, west of the same meridian, Northwest Territory.

—— halli n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 391, pl. 68, fig. 11. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— hornii n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 106, 107, pl. 29, fig. 217. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon, Cal.

—— nuciformis n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 107, pl. 28, fig. 218. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon; near Clayton; San Diego, Cal.

Lunatia—Continued.

—— obtusivolva (Gabb) Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 45, pl. 1, fig. 11. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.

—— occidentalis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 315, 316, pl. 32, figs. 12*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Dak.

—— pedernalis (Roem. sp.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 259, 260, pl. 35, fig. 3. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— rectilabrum (Con. sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 296. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Common everywhere in the Ripley group.

—— shumardiana n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 106, pl. 19, fig. 61. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Hills southwest of Martinez, Cal.

—— shumardiana (Gabb) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 45. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island.

—— subcrassa (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 316, 317, pl. 39, figs. 3, *a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, on the Upper Missouri.

—— subcrassa (M. & H.) White. (1878.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur Terr., p. 185. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: On the Cache á la Poudre, Colo.

—— subcrassa (M. & H.) White. (1878.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— utahensis n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 122. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (Gyrodes?) conradiana n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 107, 108, pl. 29, fig. 219. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: On the San Luis Gonzaga ranch, at the east end of Pachecos pass, Cal.

Lunulites [——] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 82. Phila., 1834. S. G. Morton.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 82. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Luponia (subgen. Gray) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 163. Phila., 1869. W. M. Gabb.

Lutraria (Lam.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 154. Phila., 1864. W. M. Gabb.

—— **truncata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 154, pl. 22, fig. 128. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, Butte county; Chico creek, Cal.

——? —— Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 67, 68. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Delaware.

Lyonsia [Turton] Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 172. St. Petersburg, 1871. E. Eichwald.

—— **alduini** (Fisch.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 172–174, Taf. 15, figs. 1–3. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

Lyosoma n. g. White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 152, 153. Wash., 1883. C. A. White.

—— **powelli** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 153, pl. 38, figs. 6a–d. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Mouth of Thistle creek, Spanish fork canyon, Utah.

Lysis n. g. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 138. Phila., 1864. W. M. Gabb.

—— **duplicosta** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 138, pl. 21, fig. 98. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **oppansus** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 17, pl. 4, figs. 14, 15. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Pence's ranch, Butte county, Cal.

Lytoceras batesi (Trask sp.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 202, 203, pl. 27, fig. 1. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bear Skin bay, Skidegate inlet.

Lytoceras—Continued.

—— **sacya** (Forbes sp.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 203, pl. 25. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet; Skidegate inlet; Shingle bay; east side of Shingle point; shore one mile and three-quarters southwest of Welcome point; bay east of Alliford bay.

—— **timotheanum** (Mayor sp.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 203, 204. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South island; Bear Skin bay, Skidegate inlet; north shore of Cumshewa inlet.

Macrocallista (n. subgen. Meek.) (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 179. Wash., 1876. F. B. Meek.

Macrocyclis spatiosa (M. & H.?) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 244. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyo.

Macrodon —— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Macroscaphites n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 414. Wash., 1876. F. B. Meek.

Mactra (Linn) Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 269. Phila., 1856. T. A. Conrad.

—— (Linn, typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 204. Wash., 1876. F. B. Meek.

—— **alta** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 271, 271. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Bad lands of Judith river, Nebr.

—— **ashburnerii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 153, pl. 22, fig. 127. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, Butte county; Chico creek; Texas flat, Placer county; near Martinez; Tuscan springs, Tehama county; Orestimba canyon, Stanislaus county; Benicia; San Luis Gonzaga ranch, Pacheco's pass; Martinez; Marsh's, southeast of Mount Diablo; Alizos creek, near Fort Tejon, etc., Cal.

Mactra—Continued.

—— ashburnerii (Gabb) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 42. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia and Waldron islands.

—— ? cañonensis n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 308. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location. Canyon city, Colo.

—— ? cañonensis (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 297, 298, pl. 9, figs. 11*a–c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Canyon city, Colo.

—— ? emmonsi n. s. Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 153, 154, pl. 15, fig. 8. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: East Canyon creek, Wasatch range, Utah.

—— formosa n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 271. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Near mouth of Judith river, Nebr.

—— gibbsana Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 374, pl. 2, figs. 8, 8*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous or Tertiary.
Location: Found loose on the Straits of Fuca.

—— gracilis M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 179. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above the mouth, Nebr.

—— holmesi (Meek sp.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear and Ralston creeks, Colo.

—— ? holmesi (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 295–297, pl. 6, figs. 4*a–c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Ralston [Van Bibber?] creek, three or four miles north of Golden city, Colo.

—— ? incompta n. s. White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, p. 185, pl. 17, figs. 6*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Five miles above Pueblo, Colo.

—— maia n. s. Whitfield. (1876.)
Rep. Rec. Carroll, Mont., to Yellowstone National Park, p 144. Wash., 1876. R. P. Whitfield.
Formation: Cretaceous.
Location: Near the mouth of the Judith river.

Mactra—Continued.

? —— tenuissima n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 179, pl. 29, 68. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— texana n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854, 1855, 269. Phila., 1856. T. A. Conrad.
Formation: Cretaceous. [Tertiary.]
Location: Between Laredo and Rio Grande city, Tex.

—— texana Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 148, pl. 4, figs. 1*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous. [Tertiary.]
Location: *Prairie between Laredo and Rio Grand city.

—— warrenana n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 271. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yankton trading post, Nebr.

—— (Cymbophora) alta (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 210, pl. 37, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, on the Miss and at several localities west of Greeley.

—— (Cymbophora) alta (M. & H. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur Terr., p. 225. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near White river Indian agency, C

—— (Cymbophora) alta (M. & H. Meek. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Pale-ont., vol. 1, pt. 1, p. 62. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Milk river ridge, Canada.

—— (Cymbophora) formosa (M. & H. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 207, pl fig. 7. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location; Mouth of Judith river, Idaho Terr.

—— (Cymbophora ?) gracilis (M. & H Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 209, pl. 17, figs. 18*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On the Yellowstone river, Idaho Terr one hundred and fifty miles above the mouth

—— (Cymbophora) gracilis (M. & H Whiteaves. (1885.)
Geol. and Nat. His. Sur. Can., Cont. Can. Pa ont., vol. 1, pt. 1, p. 43. Montreal, 1885. J. Whiteaves.
Formation: Cretaceous.
Location: Eastern branch of the Poplar river. the forty-ninth parallel, Canada.

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* The region mentioned above is occupied by Tertiary rocks; therefore it must be a mistake in labeling, identification.

Mactra—Continued.

—— Cymbophora gracilis (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont, vol. 1, pt. 1, p. 79. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Milk river, at the mouth of Pa-Kow-Ki coulee, Canada.

—— (Cymbophora ?) nitidula (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 211, 212, pl. 30, figs. *6a–c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Deer creek, near the north branch of Platte river.

—— (Cymbophora ?) siouxensis (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 206, pl. 1, figs. *7a–c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: On Big Sioux river two miles above its mouth.

—— (Cymbophora) ? utahensis n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 155, 156, pl. 15, figs. *9a*, *b*. Wash., 1877. F. B. Meek.

Formation: Cretaceous.

Location: East canyon creek, Wasatch range, and near Coalville, Utah.

—— (Cymbophora ?) warrenana (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 208, pl. 30, figs. *7a–d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river and Long lake, Dak., near Greeley, Colo.

—— (Cymbophora) warrenana (M. & H.) White. (1878.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Mouth of Saint Vrains creek and near Aaron Eaton's farm in the valley of the Cache a la Poudre; also at Fossil ridge, Colo.

—— (Cymbophora) warrenana (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 229. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Dodd's ranch on Ashley's fork, Utah.

—— (Cymbophora ?). warrenana (M. & H.) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 142, 143, pl. 17, fig. 9; pl. 19, figs. 3, *3a*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest side of Hornby island; Gabriola island; Blunden point, Vancouver island; Protection and Sucia islands; Newcastle island; two miles and a half up the Nanaimo river, Vancouver island.

Mactra—Continued.

—— (Cymbophora) warrenana (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont, vol. 1, pt. 1, p. 43. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: South Saskatchewan, five miles above Swift Current creek; Ross coulee, near Irvine station, on the Canadian Pacific railway, Canada.

—— (Trigonella ?) arenaria n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 154, 155, pl. 14, fig. 5. Wash., 1877. F. B. Meek.

Formation: Cretaceous.

Location: On Red creek, Uinta mountains; and on Chalk creek, Utah.

—— sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog., for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nanaimo river, Vancouver island, two and a quarter and two and a half miles up.

—— (?) sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog., for 1873–1874, p. 264. Montreal, 1874. J. F. Whiteaves.

Formation: Cretaceous.

Location: Protection island.

—— sp. undet. Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog., for 1873–1874, p. 265. Montreal, 1874. J. F. Whiteaves.

Formation: Cretaceous.

Location: Gabriola island.

Margarita (Leach) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 298. Wash., 1876. F. B. Meek.

—— mudgeana Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 300, pl. 2, figs. *9a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Twelve miles southwest of Salina, Kan.

—— nebrascensis (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 298, 299, pl. 19, figs. *8a*, *b*, and *9a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Yellowstone river, one hundred and fifty miles from its mouth, Long Lake.

—— nebrascensis (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 432, pl. 12, fig. 15. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Yellowstone river, one hundred and fifty miles above its mouth.

—— ornatissima (Gabb sp.) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 128. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest side of Hornby island; Sucia islands.

Margarita—Continued.

—— **ornatissima** (Gabb sp.) White. (1889.)
Bull. U.S. Geol. Sur. No. 51, p. 45. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia and Sheep Jack islands.

—— **triassica** n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 136, 137, pl. 17, figs. 8, 8a. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about thirty miles below Devils Portage, Canada.

Margaritana (Schumacher) Meek. (1876.)
Rep. U.S. Geol. Sur. Terr., vol. 9, pp. 112–114. Wash., 1876. F. B. Meek.

—— (Schum., typical) Meek. (1876.)
Rep. U.S. Geol. Sur. Terr., vol. 9, p. 113. Wash., 1876. F. B. Meek.

—— **nebrascensis** Meek. (1876.)
Rep. U.S. Geol. Sur. Terr., vol. 9, pp. 114, 115, pl. 1, figs. 5a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Opposite Sioux city on the Missouri river, in Dakota county, Nebr.

—— **nebrascensis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 21, pl. 4, figs. 1, 2. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southeastern Dakota.

Margaritella (M. & H.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 118. Phila., 1864. W. M. Gabb.

—— **angulata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 172, pl. 28, fig. 55. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **crenulata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 118, 119, pl. 20, fig. 74. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near San Diego, Cal.

—— **flexistriata** (E. & S.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 302, pl. 19, figs. 11a–d. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Cheyenne river, near the mouth of Sage creek.

—— **globosa** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 119, pl. 29, fig. 225. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Benicia, Cal.

Martesia (Leech) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 145. Phila., 1864. W. M. Gabb.

—— (?) **carinifera** n. s. Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 54–56, pl. 9, fig. 7. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **carinifera** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 219, pl. 29, figs. 2, 2a. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Shores of Bear Skin bay, in Skidegate inlet.

—— **cithara** (Mort. sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 304. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **clausa** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 145, pl. 22, fig. 115. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, Butte county: Texas flat, Placer county; Tuscan springs, Tehama county, Cal.

—— **clausa** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 175. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, ten miles west of Griswold's and Tejon, Cal.

—— **clausa** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 137, 138, pl. 17, figs. 2, 2a, b. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **cretacea** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 304. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **cuneata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 259, 260, pl. 30, figs. 8a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Long lake, near Fort Pierre, Dak.

—— **tumidifrons** Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 179, 180, pl. 25, figs. 1, 1a, and 2. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: North Saskatchewan river, township 54, range 2, west of the fourth principal meridian, Northwest Territory.

Martesia—Continued.

—— (Pholas) cretacea (Gabb) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 190, pl. 25, figs. 20-23. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Raritan Bay ? N. J.

—— ——? White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 236. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Meekia n. g. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 191. Phila., 1864. W. M. Gabb.

—— bullata n. s. Conrad. (1874.)

Seventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 455. Wash., 1874. T. A. Conrad.
Formation: Cretaceous.
Location: Trout creek, near Fairplay [Colo].

—— navis n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 192, 193, pl. 25, fig. 180. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; Chico creek, and Pence's ranch, Butte county, Cal.

—— radiata n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 192, pl. 25, fig. 179a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Rancho de San Luis Gonzaga, in Pacheco's pass; Orestimba canyon, Stanislaus county; Tuscan springs, Tehama county; Siskiyou mountains, Siskiyou county, Cal., Jacksonville, Oreg.

—— sella n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 191, 192, pl. 25, fig. 179. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; Tuscan springs, Tehama county; Siskiyou mountains, Cal.

Meekoceras n. g. Hyatt. (1879.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, pp. 111, 112. Wash., 1880. Alpheus Hyatt.

—— aplanatum n. s. White. (1879.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, pp. 112, 113. Wash., 1880. C. A. White.
Formation: Jura-Trias. [Triassic.]
Location: Southeastern Idaho. Locality No. 2.

—— aplanatum White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 112, 113, pl. 31, figs. 1*a–d*. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 2, about fifteen miles a little east of south from locality No. 1, southeastern Idaho.

—— gracilitatis n. s. White. (1880.)

Bull U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, pp. 114-116. Wash., 1880. C. A. White.
Formation: Jura-Trias. [Triassic].
Location: Locality No. 1, also locality No. 2, southeastern Idaho.

Meekoceras—Continued.

—— gracilitatis White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 115, 116, pl. 31, figs. 2*a–d*. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 1, within the limits of Idaho, about sixty-five miles north of the boundary line between that Territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Grays lake.

—— gracilitatis var. White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, p. 116. Wash., 1880. C. A. White.
Eormation: Jura-Trias. [Triassic].
Location: Locality No. 1, southeastern Idaho.

—— gracilitatis var. White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 116. Wash. 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 1, within the limits of Idaho, about sixty-five miles north of the boundary line between that Territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Grays lake.

—— mushbachanus n. s. White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, pp. 113, 114. Wash., 1880. C. A. White.
Formation: Jura-Trias. [Triassic].
Location: Locality No. 1. Southeastern Idaho.

—— mushbachianum White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 114. Wash,. 1883. C. A. White.
Formation: Triassic.
Location: Locality No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that Territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Grays lake.

Megistostoma n. g. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 144. Phila., 1864. W. M. Gabb.

—— striata n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 144, pl. 21., figs. 108, 108*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: About a mile northeast of Martinez, Cal.

Melampus (Monfort) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 23. Wash. 1883. C. A. White.

—— antiguus n. s. Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 507. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, near Coalville, Utah.

—— antiguus (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 236, 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Melampus—Continued.

—— ? **antiguus** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 23–25, pl. 12, figs. 11*a–d*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, near Coalville, Utah.

—— **antiguus** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 38, pl. 5, figs. 13–16. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **priscus** n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 315. Phila., 1861. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Bear river, near mouth of Sulphur creek, lat. 41° 12′ north, long. 110° 52′ west.

—— ——? White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 25, pl. 12, fig. 6*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

——? ——? White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 38. pl. 5, fig. 17. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming.

Melania (Lam.) M & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 444, Phila., 1862. Meek & Hayden.

—— **anthonyi** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 124. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Yellowstone river, thirty miles above the mouth.

—— **convexa** n. s. M & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 125. Phila. 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Bad lands of the Judith.

—— **convexa** M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 138. Phila., 1858. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Union, Nebr.

—— **humerosa** n. s. Meek. (1860.)
Pro. Acad. Nat. Sci., Phila., for 1860, p. 313. Phila., 1861. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Bear river, lat. 40° 12′ north, long. 110° 52′ west.

—— **insculpta** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Rock springs, Wyo.

Melania—Continued.

—— **insculpta** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bitter creek valley, two miles west of Point of Rocks station, Wyo.

—— **insculpta** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 221. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Rock springs, and two miles below Point of Rocks, Wyo.

—— ? **insculpta** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 94, 95, pl. 20, fig. 4*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Rock springs, Wyo.

—— ? **insculpta** (Meek) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can. Cont. Can. Paleont., vol. 1, pt. 1, pp. 73, 74, pl. 10, fig. 6. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Coulee "about fourteen miles north-eastward from the most eastern of the Three Buttes" and near the forty-ninth parallel; south Saskatchewan, six miles below the mouth of Bow river; north side of Milk river, five miles below Pa-kaw-ki coulee, and south side of Milk river, one mile above the mouth of Pa-kow-ki couleo, Canada.

—— **insculpta** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 54, pl. 26, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southern Wyoming.

—— **invenusta** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 137. Phila., 1858. Meek & Hayden.
Formation: [Cretaceous.]
Location: Bad lands of Judith river, Nebr.

—— **minutula** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 123, 124. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union.

—— **multistriata** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 124. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Ten miles above Fort Union.

—— **nebrascensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 124, 125. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Ten miles above Fort Union.

—— (?) **omitta** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 136. Phila., 1858. Meek & Hayden.
Formation: [Cretaceous.]
Location: Mouth of Judith river, Nebr.

Melania—Continued.

— **sublævis** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, pp. 136, 137. Phila., 1858. Meek & Hayden.

Formation: [Cretaceous.]

Location: Bad lands of Judith river, Nebr.

— **subtortuosa** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 136. Phila., 1858. Meek & Hayden.

Formation: [Cretaceous.]

Location: Mouth of Judith river, Nebr.

— **tenuicarinata** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, pp. 137, 138. Phila., 1858. Meek & Hayden.

Formation: [Cretaceous.]

Location: Fort Union, Nebr.

— **warrenana** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 137. Phila., 1858. Meek & Hayden.

Formation: [Cretaceous.]

Location: Summit of Square butte, thirty miles below Fort Clark, on the Missouri, Nebr.

— **wyomingensis** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 171, 172. Wash., 1879. C. A. White.

Formation; Cretaceous.

Location: Crow creek valley, Colo.

— **wyomingensis** (Meek) White. 1879.

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 191. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Valley of Bijou creek, Colo.

— **wyomingensis** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 209. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Yampa valley, near Canyon park, Colo.

— **wyomingensis** (Meek) White. 1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 213. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Danforth hills, Colo.

— **wyomingensis** Meek. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 220, 221. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Black buttes station, Wyo.

— **wyomingensis** (Meek) White. 1893.)

Third Ann. Rep. U. S. Geol. Sur., p. 54, pl. 26, figs. 1–3. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of the South Platte river, Colo., east of the Rocky mountains.

Melania—Continued.

—— **wyomingensis** (Meek) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 95, 96, pl. 26, figs. 6*a*, *b*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Black buttes station, Wyo.; Danforth hills, Colo., Valley of Crow creek, northern Colo.; other localities east of the Rocky mountains in Colorado.

—— **wyomingensis** (Meek), Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 21. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Upper Belly river, twenty-two and twenty-three miles above the mouth of the Waterton, Canada.

—— (**Goniobasis** ?) **wyomingensis** n. s. Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 516. Wash., 1873. F. B. Meek.

Formation: [Cretaceous.]

Location: Black butte station, Union Pacific railroad, Wyo.

—— (**potodoma**) **veterna** n. s. M. & H. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, pp. 444, 445. Phila., 1862. Meek & Hayden.

Formation: Cretaceous.

Location: Head Wind river, Nebr.

Melanopsis (Lamarck) White. (1882.)

Proc. U. S. Nat. Mus., vol. 5, p. 96. Wash., 1883. C. A. White.

—— **americana** n. s. White. (1882.)

Proc. U. S. Nat. Mus., vol. 5, p. 96, pl. 4, figs. 9 and 10. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of South Platte river, northeastern Colorado.

—— **americana** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 55, pl. 23, figs. 21–23. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: East of the Rocky mountains, in Colo.

Meleagrina (Lam) Gabb. (1869.)

Geol. Sur. Cal. Paleont, vol. 2, p. 192. Phila., 1869. W. M. Gabb.

—— **amygdaloidea** n. s. Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 78, 79, pl. 10, fig. 4. Montreal, 1876. J. F. Whiteaves.

Formation: Cretaceous.

Location. Queen Charlotte islands.

—— **antiqua** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont, vol. 2, pp. 192, 193, pl. 31, fig. 89. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Departure bay, Nanaimo, Vancouver island.

Meleagrinella n. g. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 71, 72. Wash., 1885. R. P. Whitfield.

—— **abrupta** (Con.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 72, 73, pl. 14, figs. 11-14. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold, N. J.

Melina (?) **mytiloides**(?) (Lam. sp.) Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 80-82, fig. 8, *a-d*, p. 80. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **skidegatensis** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 239. Montreal, 1884. J. F. Whiteaves
Formation: Cretaceous.
Location: South side of Alliford bay, in Skidegate inlet.

Membranipora (Blaine) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 157. Phila., 1862, 1863. Gabb & Horn.

—— **abortiva** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 157, 158 [pl. 20], fig. 41. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, and near Mullica Hill, N. J.

—— **perampla** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 158 [pl. 20], fig. 42. Phila., 1862, 1863 Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

—— **plebia** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 158, 159 [pl. 20], fig. 43. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

—— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 216. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Point of Rocks station, Wyo.

—— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 217. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Point of Rocks station, Wyo.

—— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

Menetus (subgen. H. & A. Ad.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 536. Wash., 1876. F. B. Meek.

Meretrix (Lam.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 326. Phila., 1855-1858. T. A. Conrad.

—— **arata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 166, pl. 30, fig. 250. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county; Siskiyou mountains; Orestimba canyon, Stanislaus county, Cal.

—— **californiana** n. s. Conrad. (1855.)
Rep. Expl. and Sur. P. R. R. Miss. River to Pacific ocean, App. Prelim. Geol. Rep. of W. P. Blake, Pal., p. 9. Wash., 1855. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— **californiana** Conrad. (1856.)
Rep. Expl. and Sur. P. R. R. Miss. River to Pacific ocean, vol. 5. App. p. 320, pl. 2, fig. 4. Wash., 1856. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— **californica** (Con.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 166, 167. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.

—— **fragilis** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 185, pl. 30, fig. 77. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 164, pl. 23, fig. 144. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

—— **hornii** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 186, pl. 30, fig. 78. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.

—— **lens** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 164, pl. 23, fig. 143. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Chico creek, Butte county, Cal.

—— **longa** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 165, pl. 23, fig. 147. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **nitida** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 165, pl. 23, figs. 145, 146. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; shores of the Straits of Carquines; Orestimba canyon; Chico and Cow creeks, Cal.

eretrix—Continued.

— ovalis n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 166, pl. 30, fig. 251. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

— tippana n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 326, pl. 34, fig. 18. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

— uvasana n. s. Conrad. (1855.)
Rep. Expl. and Sur. P. R. R. Miss. River to Pacific ocean, App. Prelim. Geol. Rep. of W. P. Blake, Pal., p. 9. Wash., 1855. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

— uvasana Conrad. (1856.)
Rep. Expl. and Sur. P. R. R. Miss. River to Pacific ocean, vol. 5, App. p. 320, pl. 2, fig. 3. Wash., 1856. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

— uvasana (Con.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 163, 164, pl. 30, fig. 248. Phila., 1864. W. M. Gabb.
Formation : Cretaceous.
Location: Near Fort Tejon; near Martinez, Cal.

— uvasana (Conrad) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 42. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia and Sheep Jack islands.

esalia (Gray) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 332, 333. Wash., 1876. F. B. Meek.

— ? kansasensis Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 333, 334, pl. 2, figs. 7a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

—— obsuta n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 20, pl. 4, fig. 607. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Pence's ranch, Butte county, Cal.

esorhytis (n. subgen.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 356, Wash., 1876. F. B. Meek.

— (subgen.) ? Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 364. Wash., 1876. F. B. Meek.

etacypris forbesii (Jones) White. (1886.)
Bull. U. S. Geol. Sur., No. 29, pp. 23, 24, pl. 4, figs. 22-24. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Canyon city, Colo.

Metacypris—Continued.

—— forbesii (Jones) White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 24. pl. 4, figs. 25, 26. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Canyon city, Colo.

—— ? (Jones) White. (1886.)
Bull. U. S. Geol. Sur. No. 29, p. 24. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Canyon city, Colo.

Metaptera (subgen. Raf.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 515. Wash., 1876. F. B. Meek.

Metis (subgen. H. & A. Ad.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 194. Wash., 1876. F. B. Meek.

Micrabacia (Edwards & Haime) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 1. Wash., 1876. F. B. Meek.

—— americana (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 1, 2, pl. 28. figs. 1a-d. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

Micropyrgus Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 574. Wash., 1876. F. B. Meek.

—— minutulus (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 575, pl. 43, figs. 18a, b. Wash., 1876. F. B. Meek.
Formation: Probably Eocene. [Cretaceous.]
Location: Three miles below Fort Union, Dak.

—— minutulus (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 98. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Fort Union, on the Upper Missouri river.

—— minutulus (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 59, pl. 26, fig. 20. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Fort Union beds.

Microstizia n. g. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 4. Wash., 1876. F. B. Meek.

—— millepunctata n. s Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 4, pl, 28, figs. 2a-c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Nebr.

Miliola ? bursa Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 1. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

Miliola—Continued.

—— **lævis** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 2a. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **striata** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 1. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Milthea (subgen. H. & A. Ad.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 131. Wash., 1876. F. B. Meek.

Mitra [Lam.] Conrad. (1850.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 39. Phila., 1850–1854. T. A. Conrad.

—— **cretacea** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 2, p. 103, pl. 28, fig. 215. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **cretacea** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 158. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.

—— **georgiana** n. s. Conrad. (1850.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 39, pl. 1, fig. 4. Phila., 1850–1854. T. A. Conrad.
Formation: Eocene [Cretaceous?].
Location: Georgia.

Modiola (Lam.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 395. Phila., 1858–1860. W. M. Gabb.

—— **attenuata** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 36. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: St. Mary river, near its confluence with the Belly river; three miles north of Ross coulee, near Irvine station, Canada.

—— **burlingtonensis** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 65, 66, pl. 17, figs. 8, 9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **concentrico-costellata** n. s. Roemer. (1849.)
Tex., p. 403. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba river, Tex.

—— **concentrico-costellata** Roemer. (1852.)
Kreide von Tex., p. 54, Taf. 7, figs. 10, *a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and San Saba valley, Tex.

Modiola—Continued.

—— **cylindrica** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 185, pl. 25, fig. 167. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, Butte county; Tuscan springs; Martinez, Cal.

—— **formosa** (M. & H.) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876, 1877, p. 151. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake, British Columbia.

—— **formosa** (M. & H.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 403. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake.

—— **granulata-cancellata** n. s. Roemer. (1852.)
Kreide von Tex., pp. 54, 55, Taf. 7, figs. 12*a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ravine, three miles from New Braunfels, on road to Seguin, Tex.

—— **juliae** n. s. Lea. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 149. Phila., 1862. Isaac Lea.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **julia** (Lea) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 64, 65, pl. 17, figs. 6, 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **johnsoni** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 207, pl. 28, figs. 8, 9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Farmingdale, N. J.

—— **major** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 191, 192, pl. 31, fig. 88. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location. East of Knoxville, Lake county; Morgan valley, south of Clear lake, and at Hot Sulphur springs, east of Clear lake, Colusa county, Cal.

—— **ornata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 184, 185, pl. 24, fig. 166. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez and Marsh's, Cal.

—— **ornata** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 167. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island, Sucia islands.

Modiola—Continued.

—— **ovata** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d. ser., 1858–1860, p. 396, pl. 68, fig. 31. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Timber creek, N. J.

—— **ovata** (Gabb) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, p. 197, pl. 26, figs. 13, 14. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Timber creek, N. J.

—— **pedernalis** n. s. Roemer. (1849.)

Tex., p. 403, Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Fredericksburg and San Saba river, Tex.

—— **pedernalis** Roemer. (1852.)

Kreide von Tex., pp. 53, 54, Taf. 7, figs. 11*a*, *b*. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Fredericksburg and San Saba valley, Tex.

—— **pertenuis** (M. & H.) Whiteaves. (1878.)

Can. Nat., vol. 8, n. ser., No. 7, pp. 403, 404. Montreal, 1878. J. F. Whiteaves.

Formation: Jurassic.

Location: Iltasyouco river and Sigutlat lake.

—— **pertenuis** (M. & H.) Whiteaves. (1878.)

Geol. Sur. Can., Rep. Prog. for 1876–1877, p. 153. Montreal, 1878. J. F. Whiteaves.

Formation: Jurassic.

Location: Iltasyouco river, Sigutlat lake, British Columbia.

—— **saffordi** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 395, 396, pl. 68, fig. 30. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Hardeman county, Tenn.

—— **siskiyouensis** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 184, pl. 30, fig. 260. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Siskiyou mountains, Cal. and Oreg.; Jacksonville, Oreg.

—— **subimbricata** (Meek) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 237. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: East end of Maud island.

—— **tenuisculpta** n. s. Whiteaves (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 188, 189, pl. 26, figs. 2, 2*a*. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Swan river, township 37, range 26 west; Rolling river, township 35, range 26 west, Manitoba.

Modiola—Continued.

—— (**Brachydontes**) **dichotoma** n. s. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 37, pl. 4, figs. 3, 3*a*. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: St. Mary river near its confluence with the Belly river, Canada.

—— (**Brachydontes**) **multilinigera** n. s. Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 492, 493. Wash., 1873. F. B. Meek.

Formation: Cretaceous.

Location: Near Coalville, Utah.

—— (**Lithodomus ?**) **inflata** n. s. Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 197, 198, pl. 26, figs. 1, 2. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Mr. Ware's pits, near Mullica hill, N. J.

—— (**Mytilus**) **dufreynoyi** (d'Orb.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, p. 128. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Kadiak and Unga islands, Alaska.

—— (**Perna**) **formosa** n. s. M. & H. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 439. Phila., 1862. Meek & Hayden.

Formation: Jurassic.

Location: Big Horn mountains, Nebr.

—— **sp. undet.** Roemer. (1849.)

Tex., p. 403, Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall near New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide von Tex., p. 54, Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— (**sp. undet.**) Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 73, 74. Montreal, 1876. J. F. Whiteaves.

Formation : Cretaceous.

Location : Queen Charlotte islands.

—— (**sp. undet.**) Hill. (1888.)

Ann. Rep. Geol. Sur. Ark., for 1888, vol. 2, p. 133, pl. 2, figs. 18, 18*a*, 19, 19*a*. Little Rock, 1888. R. T. Hill.

Formation : Cretaceous.

Location : Arkansas.

Modiolaria (subgen. Beck) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 75. Wash., 1876. F. B. Meek.

Modiomorpha ? (H. & W.) Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 103. Wash., 1877. F. B. Meek.

Modiomorpha—Continued.

—— ? lata n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 103, 104, pl. 10, fig. 2. Wash., 1877. F. B. Meek.

Formation: Triassic.

Location: North fork of Buena Vista canyon, West Humboldt range.

—— ? ovata n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 103, pl. 10, figs. 1, 1a. Wash., 1877. F. B. Meek.

Formation: Triassic.

Location: North fork of Buena Vista canyon, West Humboldt range.

Moera (subgen. H. & A. Ad.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

Molopophorus n. subgen. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 156, 157. Phila., 1869. W. M. Gabb.

Monopleura (Matheson) White. (1884.)

Bull. U. S. Geol. Sur. No. 4, p. 8. Wash., 1884. C. A. White.

—— pinguiscula n. s. White. (1884.)

Bull. U. S. Geol. Sur. No. 4, pp. 8, 9, pl. 5. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Vicinity of Austin, Tex.

—— pinguiscula (White) Roemer. (1888.)

Paleont. Abhandl., Vierter Band, Heft 4, pp. 11, 12, Taf. III [xxxiii], figs. 2a–2c. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— marcida n. s. White. (1884.)

Bull. U. S. Geol. Sur., No. 4, p. 8, pls. 3 and 4, Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Vicinity of Austin, Tex.

—— marcida (White) Roemer. (1888.)

Paleont. Abhandl., Vierter Band, Heft 4, pp. 10, 11, Taf. III [xxxiii], figs. 1a–1d. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— subtriquetra n. s. Roemer. (1852.)

Kreide von Tex., p. 81, Taf. 5, figs. 5a, b. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: San Saba valley and upper course of Pedernales river, Tex.

—— texana n. s. Roemer. (1852.)

Kreide von Tex., p. 81, Taf. 5, figs. 3a, b. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waco camp, on the Guadalupe above New Braunfels, Tex.

Monotis (Brown) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 31. Phila., 1864. W. M. Gabb.

—— circularis n. s. Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 15, 16, pl. 7, figs. 14, 14a, Phila., 1870. W. M. Gabb.

Formation: Triassic.

Location: New pass, near Austin [Nev.].

—— ovalis n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 132, 133, pl. 17, fig. 1. Montreal, 1889. J. F. Whiteaves.

Formation: Triassic.

Location: Liard river, about twenty-five miles below Devil's Portage, Canada.

—— salinaria n. s. Fischer. (1872.)

Comptes Rend., 1872, vol. LXV, p. 1785. Paris, 1872. P. Fischer.

Formation: Triassic.

Location: Alaska.

—— salinaria (Brown) Fischer. (187

Voyages à la Côte Nord-ouest de l'Amérique, pp 33, 34, pl. *A*, fig. 2, par Alph L. Pinart. Paris, 1875. P. Fischer.

Formation: Triassic.

Location: Alaska.

—— septentrionalis n. s. Haughton. (1856.)

Jour. Roy. Dublin Soc., vol. 1, No. 4, p. 245, pl. 9, figs. 6, 7. Dublin, 1858. S. Haughton.

Formation: Jurassic.

Location: Point Wilkie, Prince Patrick's land.

—— subcircularis n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 31, pl. 6, figs. 29, 29a. Phila., 1864. W. M. Gabb.

Formation: Triassic.

Location: Gifford's ranch, Plumas county, Ca ; Star district, Humboldt county, Nev.

—— subcircularis (Gabb) Whiteaves. (1877.)

Geol. Sur. Can., Rep. Prog. for 1875, 1876, App. II., p. 97. Montreal, 1877. J. F. Whiteaves.

Formation: Triassic.

Location: A few miles above Fossil point, Pea river.

—— subcircularis (Gabb) Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser., 18 App. I, p. 108, B. Montreal, 1887. J. F. Whiteaves.

Formation: Triassic.

Location: A few miles above Fossil point, on the Peace river, lat. 56° 10′ long. 122° 10′; Fossil ridge, Upper Pine river, lat. 55° 30′ long. 12 ; south side of Houston Stewart channel, Queen Charlotte islands, nearly opposite Rose harbor; Section cove, north end of Barnby island, Q. C. I.; south side of Skidegate channel, Q. C. I.; a mile and a half west of Log point.

notis—Continued.

— subcircularis (Gabb) Whiteaves. 1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 131, 132, pl. 17, figs. 3, 3*a*. Montreal, 1889. J. F. Whiteaves.

Formation: Triassic.

Location: A few miles above Fossil point on the Peace river, in lat. 56° 10′ and long. 122° 10′; Fossil ridge, Upper Pine river, in lat. 55° 30′ and long. 120°; Whipsaw creek, headwaters of the Similkameen; south side of Skidegate channel, Q. C. I., a mile and a half west of Long point, Canada.

ntivaltia atlantica (Mort. sp.) Lons- ale. (1844.)

Quart. Jour. Geol. Soc., London, vol. 1, pp. 65–67, figs. *a*, *b*, p. 65. London, 1845. William Lonsdale.

Formation: Cretaceous.

Location: Timber creek, N. J.

rea n. g. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 290. Phila., 1858–1860. T. A. Conrad.

— (subgen. Con.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 301. Phila., 1858–1860. W. M. Gabb.

— cancellaria n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 290, pl. 46, fig. 30. Phila., 1858–1860. T. A. Conrad.

Formation: Cretaceous.

Location: Eufaula, Ala., and Tippah county, Miss.

rio (Montf.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 104. Phila., 1864. W. M. Gabb.

— (Sconsia) tuberculatus n. s. Gabb. 1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 104, 105, pl. 19, fig. 57. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Bulls Head point, Martinez; Clayton, Contra Costa county; near San Diego, Cal.

rtoniceras n. g. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 448, 449. Wash., 1876. F. B. Meek.

— shoshonense n. s. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 449, 450, pl. 6, figs. 3*a*, *c* and 6*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Head of Wind river valley, Wyo.

— ? vermilionense (M. & H.) Meek. 1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 450–452, pl. 7, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Vermilion river, Nebr.

Multicresis (d'Orb.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 401. Phila., 1858–1860. W. M. Gabb.

—— parvicella n. s. G. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 367. Phila., 1861. Gabb & Horn.

Formation: Cretaceous.

Location: New Jersey.

Multicresis parvicella (G. & H.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 401, pl. 69, figs. 36–38. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

—— parvicella G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 178 [pl. 21], fig. 70. Phila., 1862, 1863. Gabb & Horn.

Formation: Miocene [Cretaceous].

Location: Timber creek and near Mullica hill, N. J.

Mya (Linn.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, p. 124. St. Petersburg, 1871. E. Eichwald.

—— crassa (Grew.) Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, p. 124. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaskan peninsula and Unga island.

—— sp. undet. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.

Formation: [Cretaceous.]

Myacites (Schlot.) Conrad. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 166. Phila., 1858. T. A. Conrad.

—— depressus n. s. Meek. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 51, 52, pl. 8, figs. 6, 6*a*. Phila., 1864. F. B. Meek.

Formation: Jurassic.

Location: Genesee valley, Plumas county, Cal.

—— depressus (Meek) Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 11. Phila., 1870. W. M. Gabb.

Formation: Jurassic.

Location: Volcano, about thirty miles southeast of Walkers lake, Nev.

—— inconspicuus n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 137, pl. 12, fig. 10. Wash., 1877. F. B. Meek.

Formation: Jurassic.

Location: Weber canyon, Wasatch range, Utah.

—— nebrascensis n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 182. Phila., 1861. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of Black hills, Nebr.

Myacites—Continued.

—— **nebrascensis** M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 100, 101, pl. 4, fig. 5. Wash., 1865. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— **pennsylvanicus** n. s. Conrad. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 166. Phila., 1858. T. A. Conrad.

Formation: Black shale. [Triassic ?]

Location: Phœnixville, Penn.

—— **pertenuis** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 51. Phila., 1859. Meek & Hayden.

Formation: Jurassic.

Location: West base of Black hills.

—— **subcompressus** (Meek) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 151, 152, pl. 38, figs. *5a–e*. Wash., 1883. C. A. White.

Formation: Jurassic.

Location: Near lower canyon of Yellowstone river, Mont.

—— **subellipticus** M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 101, pl. 4, figs. 6, *a–c*. Wash., 1865. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— (Panopoea ?) **humboldtensis** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 28, pl. 5, fig. 22. Phila., 1864. W. M. Gabb.

Formation: Triassic.

Location: Buena Vista district, Humboldt mining region, Nev.

—— (Pleuromya) **subcompressa** Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 136, 137, pl. 12, figs. 6, 6*a*. Wash., 1877. F. B. Meek.

Formation: Jurassic.

Location: Weber canyon, Wasatch range, Utah.

—— (Pleuromya) **weberensis** n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 127, 138, pl. 12, figs. 11, 11*a*. Wash., 1877. F. B. Meek.

Formation: Jurassic.

Location: Weber canyon, Wasatch range, Utah.

Myalina (De Koninck) Whitfield. (1876.)

Rep. Rec. Carroll, Mont., to Yellowstone National Park, p. 143. Wash., 1876. R. P. Whitfield.

—— ? (Gervillia) **perplana** n. s. Whitfield. (1876.)

Rep. Rec. Carroll, Mont., to Yellowstone National Park, p. 143, pl. 1, fig. 8. Wash., 1876. R. P. Whitfield.

Formation: Jurassic.

Location: Bridger mountains, Mont.

Myophoria (Brown) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 33. Phila., 1864. W. M. Gabb.

—— **alta** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 33, pl. 6, fig. 33. Phila., 1864. W. M. Gabb.

Formation: Triassic.

Location: Dun glen, Sierra district, Humboldt county, Nev.

—— **ambilineata** n. s. White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 166, 167, pl. 13, figs. 5*a*, *b*. Wash., 1875. C. A. White.

Formation: Jurassic.

Location: Camp Cottonwood, old Mormon road, Nev.

—— **lineata** (Münster ?) Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 133, 134, pl. 12, figs. 3, 3*a*. Wash., 1877. F. B. Meek.

Formation: Jurassic.

Location: Weber canyon, Wasatch range, Utah.

Myrtea (subgen. Turton) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 130. Wash., 1876. F. B. Meek.

Mysia (Leach) Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 278. Phila., 1858–1860. T. A. Conrad.

—— **gibbosa** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 302, pl. 48, fig. 18 [17]. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Delaware & Chesapeake canal, and N. J.

—— **parilis** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 278, pl. 46, fig. 8. Phila., 1858–1860. T. A. Conrad.

Formation: Cretaceous.

Location: Tippah county, Miss.

—— ? **polita** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 178, pl. 30, fig. 256. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Martinez; Clayton, Cal.

Mytiloides (subgen. Brong.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 39. Wash., 1876. F. B. Meek.

Mytilus (Linn.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 29. Phila., 1864. W. M. Gabb.

—— (Linn. typical.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 68. Wash., 1876. F. B. Meek.

—— **attenuatus** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 84. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Moreau trading post, Nebr.

Mytilus—Continued.

—— **ascia** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 183, pl. 30, fig. 259. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Fort Tejon, Cal.

—— **condecoratus** n. s. Conrad. (1875.)
Rep. Geol. Sur., N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 5, pl. 1, fig. 10. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— **homfrayi** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 29, pl. 6, fig. 25. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Dun glen, Seirra district, Humboldt county, Nev.

—— **humerus** n. s. Conrad. (1855.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean, App., Prelim. Geol. Rep. of W. P. Blake, pal., p. 10. Wash., 1855. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— **humerus** Conrad. (1856.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean, vol. 5, App. p. 321, pl. 2, fig. 10. Wash., 1856. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— **humerus** (Con.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 184. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.

—— **lanceolatus** (J. Sowerby) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 236, 237, pl. 31, fig. 7, 7*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Shingle bay, Skidegate inlet.

—— **meekii** n. s. E. & S. (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 40. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Moreau river.

—— **multistriatus** n. s. Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 49, pl. 7, figs. 7, 7*a*. Phila., 1864. F. B. Meek.
Formation: Jurrassic.
Location: Genesee valley, Plumas county, Cal.

—— **nasutus** n. s. Conrad. (1875.)
Rep. Geol. Sur., N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 5, pl. 1, fig. 9. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— **oblivius** n. s. Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, p. 64, pl. 17, fig. 1. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Pits of the Rev. G. C. Schanck, near Marlboro, N. J.

Mytilus—Continued.

—— **pauperculus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 183, pl. 25, fig. 165. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: West of Martinez, Cal.

—— **pauperculus** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss, vol. 1, pt. 2, p. 167. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **pauperculus** (Gabb?) White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 38. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sheep Jack island.

—— **quadratus** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 191, pl. 31, fig. 87. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez and Tuscan Springs, Cal.

—— **semiplicatus** n. s. Roemer. (1849.)
Tex., pp. 402, 403. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ravine on the Guadalupe, three miles below New Braunfels, Tex.

—— **semiplicatus** Roemer. (1852.)
Kreide von Tex., p. 55, Taf. 7, fig. 3. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ravine, three miles from New Braunfels on road to Seguin, Tex.

—— **subarcuatus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 276. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Dog river, near mouth of Judith river, Nebr.

—— **subarcuatus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 69, pl. 38, fig. 2*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Dog river, near the mouth of Judith river.

—— **subarcuatus** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 56. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Saskatchewan, eight miles below the Red Deer river, Canada.

—— **subrectus** n. s. Eichwald. (1861.)
Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 184, 185, Taf. 16, figs. 1, 2. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

Mytilus—Continued.

—— **tenuitesta** n. s. Roemer. (1849.)
Tex., p. 403. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **tenuitesta** Roemer. (1852.)
Kreide von Tex., pp. 55, 56, Taf. 7, figs. 13*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **whitei** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. region; Prelim. Rep. Paleont. Black Hills, p. 18. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: Near Sun Dance hills, northwestern Black hills, Wyo.

—— **whitei** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 360, 361, pl. 5, figs. 9-12. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Near Sun Dance hills, Black hills.

—— **whitei** (Whitfield) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 147, pl. 37, fig. 9*a*. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Near Fontanelle canyon, upon the west side of Green river basin, western Wyoming.

—— ? —— Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 45. New Haven, 1820. Thomas Say.
Formation: Alluvium [Cretaceous].
Location: Mullica hill, N. J.

Naidea (subgen. Swain.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Nassa (Lam.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 97. Phila., 1864. W. M. Gabb.

—— **antiquata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 97, pl. 18, fig. 50. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Bulls Head point, near Martinez, Cal.

—— **cretacea** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 97, pl. 18, fig. 49. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Bulls Head point, near Martinez, Cal.

—— **globosa** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 282. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: North Carolina and Pataula creek, Ga.

Natica [Lam.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 48, Phila., 1834. S. G. Morton.

—— (Adanson) Meek. (1859.)
Northwest Terr. Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 181. Toronto, 1859. F. B. Meek.

Natica—Continued.

—— **abyssina** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 49, pl. 13, fig. 13. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

—— **acutispira** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856-1860, pp. 597, 598. St. Louis, 1856-1860. B. F. Shumard.
Formation: Cretaceous.
Location: Parker county, near Brazos river, Tex.

—— **acutispira** (Shum.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 363, 364. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.

—— **alveata** n. s. Conrad. (1855.)
Rep. Expl. and Sur., P. R. R. Mississippi River to Pacific Ocean; App. Prelim. Geol. Rep. of W. P. Blake, pal. p. 10. Wash., 1855. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— **alveata** Conrad. (1856.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean, vol. 5, App., p. 321, pl. 2, figs. 8, 8*a*. Wash., 1856. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— ? **ambigua** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 64. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, Nebr.

—— **collina** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 157, pl. 13, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between Rio San Pedro and Rio Puercos.

—— **concinna** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 389, pl. 3, figs. 2*a*-*d*. Cambridge and Boston, 1855. Hall and Meek.
Formation: Cretaceous.
Location: Sage creek.

—— **gibbosa** (Lea) Conrad. (1855.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean, App. Prelim. Geol. Rep. of W. P. Blake, Pal., p. 10. Wash., 1855. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

—— **gibbosa** (Lea) Conrad. (1856.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean, vol. 5, App., p. 321. Wash., 1856. T. A. Conrad.
Formation: Tertiary [Cretaceous].
Location: Cañada de las Uvas.

Natica—Continued.

—— **infraocarinata** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 319, 320. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— ? **leilia** n. s. H. & W. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 2, pp. 298, 299, pl. 7, figs. 19–21. Wash., 1877. Hall & Whitfield.
Formation: Triassic ? [Jurassic].
Location: Northwest of Rawlings station, Wyo., and on the east fork of Duchesne river, Uinta range, Utah.

—— **moreauensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 64. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, Nebr.

—— **obliquata** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 389, pl. 3, fig. 1, *a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri.

—— **obliquata** (H. & M.) Meek. (1859.)
Northwest Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 184. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: Two creeks on the Assiniboine, Canada.

—— **occidentalis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 64. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, Nebr.

—— **oetites**? Conrad. (1855.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean. App. Prelim. Geol. Rep. of W. P. Blake, Pal. p. 10. Wash., 1855. T. A. Conrad.
Formation: Eocene [Cretaceous.]
Location: Cañada de las Uvas.

—— **oetites**? Conrad. (1856.)
Rep. Expl. and Sur. P. R. R. Mississippi River to Pacific Ocean, vol. 5, App. p. 321, pl. 2, fig. 7. Wash., 1856. T. A. Conrad.
Formation: Eocene [Cretaceous.]
Location: Cañada de las Uvas.

—— **paludinæformis** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 389, 390, pl. 3, figs. 8a–c. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri river and Sage creek.

—— ?**pedernalis** n. s. Roemer. (1849.)
Tex., p. 410. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Locality: Fredericksburg, Tex.

Natica—Continued.

—— **pedernalis** Roemer. (1852.)
Kreide von Tex., pp. 43, 44, Taf. 4, figs. 1*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **petrosa** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 48, 49, pl. 19, fig. 6. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

—— ? **prægrandis** n. s. Roemer. (1849.)
Tex., pp. 410, 411. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **prægrandis** Roemer. (1852)
Kreide von Tex., p. 44. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of Pedernales river, Tex.

—— **subcrassa** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 87. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **texana** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 157, pl. 13, fig. 1, *a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between Rio San Pedro and Rio Puercos.

—— **tuomeyana** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 270. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— (**Amauropsis**) **avellana** n. s. Roemer. (1888.)
Paleont. Abhandl. Vierter Band., Heft. 4, p. 14, 15, Taf. I [xxxi], fig. 15. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— (**Lunatia**) **rectilabrum** n. s Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 334, pl. 35, fig. 28. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— [Lam.] Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 45. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: Mullica hill, N. J.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st. ser., vol. 17, p. 282. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand. [Cretaceous.]
Location: [New Jersey. ?]

Natica—Continued.

—— sp. undet. Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 56. Nashville, 1840. G. Troost.
Formation : Cretaceous.
Location : McNairy county, Tenn.

—— —— Forbes. (1844.)
Quart. Jour. Geol. Soc. London, vol. 1, p. 63, fig. *b*, p. 63. London, 1845. Edward Forbes.
Formation : Cretaceous.
Location : New Jersey.

—— sp. undet. Roemer. (1849.)
Tex., p. 411. Bonn, 1849. F. Roemer.
Formation : Cretaceous.
Location : Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 44. Bonn, 1852. F. Roemer.
Formation : Cretaceous.
Location : Fredericksburg, Tex.

—— sp. undet. Owen. (1860.)
Second Rep. Geol. Rec. Ark., pl. 8, fig. 8. Phila., 1860. D. D. Owen.
Formation : Cretaceous.
Location : Arkansas.

—— sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation : Cretaceous.
Location : Nanaimo river, Vancouver island, two and a fourth and two and a half miles up.

—— sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 264. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— (Adanson) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 45. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sheep Jack island.

Naticina (Gray) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 109. Phila., 1864. W. M. Gabb.

—— obliqua n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 109, pl. 21, fig. 112. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Northeast of Martinez; Cañada de las Uvas and vicinity, Cal.

Nautilus [Linn] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 33. Phila., 1834. S. G. Morton.

—— (Linn, typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 490. Wash., 1876. F. B. Meek.

—— alabamensis n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 33, pl. 18, fig. 3. Phila., 1834. S. G. Morton.
Formation: Newer Cretaceous [Tertiary.]
Location: Near Claiborne, Ala.

Nautilus—Continued.

—— bryani n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 277. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Vincenttown, N. J.

—— campbelli n. s. Meek. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 318. Phila., 1862. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, eastern shore of Vancouver island.

—— campbelli Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 273, pl. 6, figs. 2, 2*a*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, Vancouver island.

—— campbelli (Meek) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 99, pl. 11, figs. 2, 2*a*, *b*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Comox, Vancouver island; northwest side of Hornsby island; Sucia islands.

—— dekayi n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 291, pl. 8, fig. 4. New Haven, 1833. S. G. Morton.
Formation: [Cretaceous.]

—— dekayi Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 33, pl. 8, fig. 4, pl. 13, fig. 4. Phila., 1834. S. J. Morgan.
Formation: Cretaceous.
Location: Monmouth and Burlington counties, N. J.; Prairie bluff, Ala.

—— dekayi (Mort.) Meek. (1859.)
Northwest Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind., p. 185, pl. 2, figs. 9, 10. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: South branch of the Saskatchewan, Canada.

—— dekayi (Morton) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 277. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— dekayi (Mort.) Meek. (1576.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 496–498, pl. 27, figs. 1*a*, *e*, fig. 67, p. 496. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Sage creek and Yellowstone river.

—— dekayi var. montanaensis n. var. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 8, p. 498, pl. 2, figs. 2*a*–*e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, Mont., one hundred and fifty miles from its mouth.

Nautilus—Continued.

—— **dekayi var. montanaensis** (Meek) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 439, 440, pl. 16, figs. 10, 11. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek, Black hills, Dak.

—— **elegans** (Sow.) Roemer. (1849.)
Tex., p. 418. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— **elegans** (Sow.) Roemer. (1852.)
Kreide von Tex., p. 37. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe, below New Braunfels, Tex.

—— **elegans** (Sow.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 499–501, pl. 8, figs. 2*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Chippewa point, Mont.

—— **elegans** (Sow.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 278. Phila., 1876. W. M. Gabb.
Formation: Cretaceous

—— **elegans var. nebrascensis** n. var. M. & H. (1862.)
Proc. Acad. Nat. Sci., Phila., for 1862, p. 25. Phila., 1863. Meek & Hayden.
Formation: Cretaceous.
Location: Chippewa point, near Fort Benton, on the upper Missouri.

—— **liardensis** n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 137, 138, pl. 18, figs. 1, 1*a*. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about twenty-five miles below Devils Portage, Canada.

—— **multicameratus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 20, pl. 3, figs. 4, 5. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Dun glen, near the Auld Lang Syne mine, Sierra district, Humboldt county, Nev.

—— **simplex** (Sow.) Roemer. (1849.)
Tex., p. 418. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— **simplex** (Sow.) Roemer. (1852.)
Kreide von Tex., p. 37. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— **suciensis** n. s. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 97–99, pl. 11, figs. 1, 1*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

Nautilus—Continued.

—— **suciensis** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 197, 198, pl. 21. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skidegate inlet, one mile and three-quarters southwest of Welcome point; Bay east of Alliford bay.

—— **texanus** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 590. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Near Austin and Bluffs of Red river, in Grayson county, Tex.

—— **texanus?** (Shum.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 59, pl. 9, figs. 3*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Aldersons gulch, Shasta county; near Mount Diablo, Cal.

—— **whitneyi** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 19, 20, pl. 3, figs. 2, 3. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Buena Vista district, Humboldt mining region.

—— n. s. Hill. (1889.)
Geol. Sur. Tex. Bull, No. 4, p. 21. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Austin, Tex.

—— **sp.** Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog., for 1873–1874, p. 261. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **sp. undet.** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 277. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Near Vincenttown, N. J.

—— **sp. undet.** Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 14–19. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

Neæra (Gray) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 203. Boston, 1862. B. F. Shumard.

—— **alæformis** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861–1862, p. 203. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Fannin county, Tex.

—— **dolabræformis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 153, pl. 22, fig. 125. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: East of Martinez, Cal.

Neæra—Continued.

—— **gibba** n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 169, 170, Taf. 16, figs. 13, 14. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location : Alaska.

—— **longirostra** n. s. Whitfield. (1877.)

U. S. Geogr. and Geol. Sur., Rocky Mt. region, Prelim. Rep. Paleont, Black Hills, pp. 24, 25. Wash., 1877. R. P. Whitfield.

Formation: Jurassic.

Location: Redwater valley, Black hills Dak.

—— **longirostra** Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 376, pl. 5, fig. 35. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: Redwater valley, Black hills.

—— **moreauensis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 239, 240, pl. 17, fig. 11*a–c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river, Dak., and on the Yellowstone river.

—— **moreauensis** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 420, pl. 11, fig. 31. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: At the forks of the Cheyenne river, Black hills.

—— **moreauensis** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 44. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Old Wives creek, township 10, range 11, west of third principal meridian, Canada.

—— ? **pumila** n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln, pp. 170, 171, Taf. 16, figs. 15, 16. St. Petersburg 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaska.

—— **striata** n. s. Eichwald. (1871.)

Geog. Paleont. Bemerk. Halb. Mang. Aleutischen Inseln. p. 170, Taf. 16, figs. 11, 12. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaska.

—— **ventricosa** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 238, 239, pl. 30, figs. 3, *a–c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river, Dak.

Neithea (Drouet) Conrad. (1855.)

Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 269. Phila., 1856. T. A. Conrad.

Neithea—Continued.

—— **complexicostata** n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 319. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Uniontown, Ala.

—— **grandicosta** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 200, pl. 33, figs. 99, *a*. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Cottonwood creek, Shasta county, Cal.

—— **mortoni** Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, pp. 365, 366. Phila., 1862. W. M. Gabb.

Formation: Cretaceous.

Location: New Jersey, Alabama, and Tennessee.

—— **occidentalis** n. s. Conrad. (1855.)

Proc. Acad. Nat. Sci., Phila., for 1854–1855, p. 269. Phila., 1856. T. A. Conrad.

Formation: Cretaceous.

Location: [Texas].

—— **occidentalis** Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 150, 151, pl. 5, figs. 1*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera, Tex.

—— **quinquecostata** (Sow.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 56, 57, pl. 8, figs. 12–14. Wash., 1885. R. P. Whitfield.

Formation; Cretaceous.

Location: Burlington, Holmdel, Freehold, Mullica hill, N. J.

—— **texana** (Roem.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1. pt. 2, p. 151, pl. 5, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera.

Nemoarca n. g. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 97. Phila., 1870. T. A. Conrad.

—— **cretacea** n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 3, Phila., 1869–1870, p. 97, pl. 9, fig. 21. Phila., 1870. T. A. Conrad.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **cretacea** (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 86, 87, pl. 12, figs. 8–10. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, and near Keyport, N. J.

Nemocardium (n. subgen. Meek.) (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 167. Wash., 1876. F. B. Meek.

Nemodon n. g. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 97. Phila., 1870. T. A. Conrad.

modon—Continued.

— angulatum Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 316., Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

— angulatum (Gabb.) Whitfield. 1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 84, 85, pl. 12, figs. 6, 7. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Burlington county, N. J.

— brevifrons n. s. Conrad. (1875.)

Rep. Geol. Sur., N. C., vol. 1. Raleigh, 1875, W. C. Kerr. App. A, p. 4, pl. 1, fig. 15. T. A. Conrad.

Formation: Cretaceous.

Location: Snow hill, Greene county, N. C.

— brevifrons (Con.) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 85, 86, pl. 12, figs. 1, 2. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

— eufalensis n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 97, pl. 9, fig. 16. Phila., 1870. T. A. Conrad.

Formation: Cretaceous.

Location: Haddonfield, N. J.

— eufalensis (Gabb) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 83, 84, pl. 12, figs. 3–5. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Holmdel and Haddonfield, N. J.

— fischeri (d'Orb. sp.) Whiteaves. 1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 234, pl. 31, fig. 5. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: East end of Maud island.

— fischeri (d'Orb. sp.) Whiteaves. 1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 250. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Maud island.

— sulcatinus (E. & S. sp.) Meek. 1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 82, 83, pl. 15, figs. 6*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Yellowstone river, one hundred and fifty miles above its mouth.

— vancouverensis (Meek sp.) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 163, 164, pl. 19, figs. 1, 1a. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Southwest side of Hornby island, southeast end and southwest side of Denman island, Sable river and Blunden point, Vancouver island.

Neptunea (Bolton) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 389. Phila., 1858–1860. W. M. Gabb.

—— curvirostris n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 88, pl. 18, fig. 37. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Cow creek Shasta county, Cal.

—— gracilis n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 90, pl. 18, fig. 42. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Bulls Head point, northeast of Martinez, Cal.

—— gracilis Gabb. (1869.

Geol. Sur. Cal. Paleont., vol. 2, p. 149. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: California.

—— hoffamannii n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 90, pl. 18, fig. 41. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: North fork of Cottonwood creek, Cal.

—— impressa n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 389, 390, pl. 68, fig. 5. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Hardeman county, Tenn.

—— mucronata n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 147, pl. 26, fig. 25. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location : Martinez, Cal.

—— perforata n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 89, pl. 18, fig. 39. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: North fork of Cottonwood creek, Cal.

—— ponderosa n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 88, pl. 18, fig. 38. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Tuscan springs (Lick springs), Pence's ranch, above Orville, Butte county, Cal.

—— ? supraplicata n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 89, pl. 18, fig. 40. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: San Diego; Clayton (?) Contra Costa county, Cal.

—— (Tritonofusus) cretacea n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 146, 147, pl. 26, fig. 24. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Martinez, Cal.

Neptunella n. subgen. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 344. Wash. 1876. F. B. Meek.

Nerinea (Defrance) Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 158. Wash., 1857. T. A. Conrad.

—— **acus** n. s. Roemer. (1849.)
Tex., p. 412, Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **acus** Roemer. (1852.)
Kreide von Tex., p. 42, Taf. 4, figs. 10*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— ? **anguillina** (Castillo and Barcena.) (1877.)
Ann. Museo. Nac. Mex., Tomo 1, pp. 201, 202, figs. 25, 26. Mexico, 1877–1879. M. Barcena.
Formation: Cretaceous.
Location: Huetamo, state of Michoacan; cavern of Cacahuamilpa, Mexico.

—— **austinensis** n. s. Roemer. (1888.)
Paleont. Abhandl. Vierter Band, Heft 4, p. 17, Taf. I [xxxi], fig. 8. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— **castilli** Barcena. (1877.)
Ann. Museo. Nac. Mex., Tomo 1, pp. 200, 201, figs. 18, 22. Mexico, 1877–1879. M. Barcena.
Formation: Cretaceous.
Location: State of Queretaro, Morelos, Hidalgo, Michoacan, Mexico.

—— **castilli** (Barcena) Urquiza. (1882.)
Ann. Min. Fomento Rep. Mex., Tomo 7, p. 224, figs. 9, 11. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Astalan and Rincon, Coalcoman district, state of Michoacan, Mexico.

—— **cultrispira** n. s. Roemer. (1888.)
Paleont. Abhandl. Vierter Band, Heft 4, pp. 17, 18, Taf. I [xxxi], fig. 9. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— **dispar** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 113, pl. 19, figs. 66, 66*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Shasta county, Cal.

—— **goodhallii** ? Barcena. (1877.)
Ann. Museo. Nac. Mex., Tomo 1, p. 201, fig. 24. Mexico, 1877–1879. M. Barcena.
Formation: Cretaceous.
Location: Near Orizaba, Mexico.

—— **hieroglifica** ? Barcena. (1877.)
Ann. Museo. Nac. Mex., Tomo 1, p. 201, fig. 23. Mexico, 1877–1879. M. Barcena.
Formation: Cretaceous.
Location: Cavern of Cacahuamilpa, in Barranca Leca, and near Orizaba, Mexico.

Nerinea—Continued.

—— **hieroglifica** (Barcena) Urquiza. (1882.)
Ann. Min. Fomento Rep. Mex., Tomo 7, p. 224, figs. 10, 12. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Cerro de los Guzimanes, and road to Rincon, Coalcoman district, state of Michoacan, Mexico.

—— **maudenses** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 214, 215, pl. 27, figs. 2, 2*a*–*d*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island, opposite Leading island, in Skidegate inlet.

—— **schottii** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 158, 159, pl. 14, figs. 3*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Oak creek, near mouth of Puercos river.

—— **subula** n. s. Roemer. (1888.)
Paleont. Abhandl. Vierter Band, Heft 4, p. 18, Taf. I [xxx.], fig. 10. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

—— **texana** Roemer. (1852.)
Kreide von Tex., p. 41, Taf. 4, fig. 7. Bonn. 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, and on the upper course of the Pedernales river, Tex.

—— **sp. undet.** (?) Roemer. (1849.)
Tex., pp. 411, 412. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Upper course of Pedernales river, Tex.

—— **sp. undet.** Roemer. (1852.)
Kreide von Tex., p. 41, Taf. 4, fig. 8. Bonn. 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of the Pedernales river, Tex.

—— **sp. undet.** Roemer. (1852.)
Kreide von Tex., pp. 41, 42, Taf. 4, fig. 9. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of the Pedernales river, Tex.

Nerita (Linn) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 137. Phila., 1864. W. M. Gabb.

—— **cuneata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 137, 138, pl. 21, fig. 97. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

—— **deformis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 137, pl. 21, fig. 96. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Cal.

Nerita—Continued.

—— **(Theliostyla) triangulata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 170, pl. 28. figs. 52, 52a. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: New Idria, Cal.

—— —— ? White. (1885.)
Bull. U. S. Geol. Sur., No. 22, p. 12, pl. 5, figs. 7, 8. Wash., 1885. C. A. White.
Formation: Cretaceous, Wallala group.
Location: Shore of Tedos Santos bay, Lower California.

Neritella (Hump.) M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 444. Phila., 1862. Meek & Hayden.

—— **nebrascensis** n. s. M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 444. Phila., 1862. Meek & Hayden.
Formation: Cretaceous.*
Location: Head of Wind river, Nebr.

—— **nebrascensis** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 109, 110, fig. 3 text. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Head of Wind river, Dak.

Neritina (Lam.) White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, G. M. Wheeler, p. 24. Wash., 1874. C. A. White.

—— (Lam.) White. (1874.)
Prelim. Rep. Invert. Foss., Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, p. 24. Wash., 1874. C. A. White.

—— **bannisteri** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **bannisteri** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., part 1, pp. 25, 26, pl. 12, figs. 10a–c. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Carletons coal mine, Coalville, Utah.

—— **bannisteri** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 52, pl. 5, figs. 11, 12. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **bruneri** n. s. White. (1882.)
Proc. U. S. Nat. Mus., vol. 5, pp. 95, 96, pl. 4, figs. 7, 8. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of South Platte river, northeastern Colorado.

Neritina—Continued.

—— **bruneri** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 53, pl. 28, figs. 12, 13. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: East of the Rocky mountains in northern Colorado.

—— **incompta** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 250. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyo.

—— **incompta** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 308, 309, pl. 7, figs. 6a–c. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Sulphur creek, near Hilliard station, Wyo.

—— **naticiformis** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 715. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, near the mouth of Sulphur creek, Wyo.

—— **naticiformis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 244. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Nellis station, Wyo.

—— **naticiformis** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 89, pl. 30, figs. 3a, b. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near mouth of Sulphur creek, valley of Bear river, Wyo.

—— **naticiformis** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 52. pl. 7, figs. 5, 6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **nebrascensis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 51, pl. 3, figs. 10, 11. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Vicinity of the Black hills.

—— **nebrascensis** (M. & H.) White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 23, pl. 4, fig. 16. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Black hills of Dakota.

—— **nebrascensis** ? (M. & H.) Hill. (1888.)
Ann. Rep. Geol. Sur. Ark., for 1888, vol. 2, p. 129. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous?
Location: Arkansas.

[*Referred to the Jurassic by Mr. Meek in 1865. The true geological age of the strata is yet in doubt. See Meek, F. B., Pal. Up. Missouri, pp. 109, 110. Wash., 1865.]

Neritina—Continued.

—— **phaseolaris** n. s. White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian. G. M. Wheeler, p. 24. Wash., 1874. C. A. White.
Formation: Jurassic.
Location: Salt creek, near Nephi, Utah.

—— **phaseolaris** n. s. White. (1874.)
Prelim. Rep. Invert. Foss., Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, p. 24. Wash., 1874.
Formation: Jurassic.
Location: Salt creek, near Nephi, Utah.

—— ? **phaseolaris** White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, pp. 167, 168, pl. 13, figs. 1*a–e*. Wash., 1875. C. A. White.
Formation: Jurassic.
Location: Salt creek, near Nephi, Utah.

—— **pisiformis** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 500, 501. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **pisiformis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **pisiformis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 26, 27. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **pisum** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 308, pl. 7, figs. 11*a–c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **pisum** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? **powelli** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 110, 111. Wash., 1876. C. A. White.
Formation: Jurassic.
Location: Mouth of Thistle creek, Spanish fork canyon, Utah.

—— **volvilineata** n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 131. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous].
Location: Black buttes, Wyo.

—— **volvilineata** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 209. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley, near Canyon park, Colo.

Neritina—Continued.

—— **volvilineata** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 220. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black buttes station, Wyo.

—— **volvilineata** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 88, 89, pl. 21, figs. 6*a*, *b*. Wash. 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes station, Wyo.

—— **volvilineata** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 52, pl. 22, figs. 12, 13. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— **(dostia ?) bellatula** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 497, 498. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— **(dostia ?) carditoides** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 499. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— **(dostia ?) patelliformis** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 498, 499. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Neritella) bannisteri** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 499, 500. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— **(Neritella) pisum** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 500. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Velatella) baptista** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol 4, No. 3, pp. 715, 716. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Black buttes station, Union Pacific railroad, Wyo.

—— **(Velatella) baptista** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 220. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black buttes station, Wyo.

eritina—Continued.

— (Velatella) baptista White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 89, 90, pl. 29, figs. 6*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes station, Wyo.

— (Velatella) baptista White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 52, pl. 23, figs. 16–20. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

— (Velatella) bellatula (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

— (Velatella) bellatula (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 52, pl. 5, figs. 8, 9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

— (Velatella) bellatula (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 27, 28, pl. 12, figs. 8*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

— (Velatella) carditoides (Meek) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, pp. 189, 190, pl. 18, figs. 7*a–c*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: South of Last bluff, Utah.

— (Velatella) carditoides (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

— (Velatella) carditoides (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 52, pl. 5, fig. 10. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

— (Velatella) carditoides (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 28, 29, pl. 12, fig. 7*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

— (Velatella) patelliformis (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Neritina—Continued.

—— (Velatella) patelliformis (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 309, pl. 7, figs. 7*a–d*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (Nelatella) patelliformis var. weberensis n. var. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (Velatella) patelliformis var. weberensis White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 309, 310, pl. 7, figs. 8*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— —— ? White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 62, pl. 10, fig. 12. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Palace camp, Wash.

Neritopsis (Gratel.) Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 598. St. Louis, 1856–1860. B. F. Shumard.

—— biangulatus n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 598. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Alexander's bend, Grayson county, Tex.

Neverita (Risso) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 108. Phila., 1864. W. M. Gabb.

—— globosa n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 161, pl. 27, fig. 39. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Ten miles west of Griswold's on the road from San Juan to New Idria, and southeast of the "Sheep well," Cal.

—— secta n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 108, 109, pl. 220, 220*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon, Cal.

Nisea (subgen. Swain) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Niso (Risso) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 116. Phila., 1864. W. M. Gabb.

—— polita n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 116, pl. 21, fig. 113. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Northeast of Martinez, Cal.

Nodosaria (Lam.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur. vol. 1, pt. 2, p. 159. Wash., 1857. T. A. Conrad.

—— acus Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 3. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— ampla Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 6. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— sulcata nils. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 214. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville and Turtle mill, N. J.

—— texana n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 159, pl. 14, figs 4*a*–*c*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between El Paso and Frontera.

—— tumescens Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 4. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— vulgaris Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 2. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— vulgaris Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 5. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— sp. Reuss. (1861.)

Math.Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861. Band XLIV, p. 334. Wien., 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

—— (d'Orb.) Reuss. (1861.)

Math.-Naturw.Cl. Kaiserl. Akad.Wiss.Sitzungsb., 1861. Band. XLIV, p. 334. Wien., 1862. A. E. Reuss.

Nucleolites (Lam.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 75. Phila., 1834. S. G. Morton.

—— crucifer Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 294. New Haven, 1833. S. G. Morton.
Formation: [Cretaceous.]
Location: United States.

—— crucifer Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 75, pl. 3, fig. 15. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Nucleolites—Continued.

—— crucifer (Morton) Desor. (1858.)

Synop. Echinoides Foss., p. 262. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: New Jersey.

—— crucifer (Morton) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 217, 218. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Brownville, N. J.

—— lyelli (Couper MSS.) Conrad. (1850.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 40, pl. 1, fig. 14. Phila., 1850–1854. T. A. Conrad.
Formation: Tertiary [Cretaceous ?].
Location: Baker county, Ga.

—— mortoni (Couper MSS.) Conrad. (1850.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 40, pl. 1, fig. 11. Phila., 1850–1854. T. A. Conrad.
Formation: Tertiary [Cretaceous ?].
Location: Palmyra, Lee county, Ga.

Nucula [Lam.] Morton. (1834.)

Synop. Org. Rem. Cret. Gr., U. S., p. 65. Phila., 1834. S. G. Morton.

—— (Lam. typical) Meek. (1876.)

Rep. U. S, Geol. Sur. Terr., vol. 9, p. 98. Wash., 1876. F. B. Meek.

—— bellastriata n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 202, 203. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Red river bluffs, Fannin county, Tex.

—— bellastriata (Shumard) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 38, pl. 18, figs. 5*a*–*c*. Wash., 1883. C. A. White.

—— cancellata n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 85. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— cancellata (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 102, 103, pl. 28, figs. 13*a*–*e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Long lake, Deer creek, on the North Platte.

—— cancellata (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 181. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of the Cache à la Poudre, near Golden city, Colo.

—— cancellata (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Golden city, Colo.

Nucula—Continued.

—— **cancellata** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 37, 38. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: St. Mary river, eleven miles above its mouth, Canada.

—— **cancellata** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 79. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Milk river, at the mouth of Pa-Kow-Ki coulee and Milk river, four miles east of the crossing of MacLeod Benton trail, Canada.

—— **cuneifrons** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 281, pl. 46, fig. 33. Phila., 1858–1860. T. A. Conrad.

Formation: Cretaceous.

Location: Eufaula, Ala.

—— **distorta** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 396, 397, pl. 68, fig. 34. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Cut on the Memphis and Charleston R. R., where it crosses the Tennessee and Mississippi State line.

—— **eufalensis** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 397, pl. 68, fig. 35. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Eufaula, Ala.

—— **equilateralis** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, pp. 84, 85. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Moreau river, Nebr.

—— **ermani** (Gir.) Eichwald. (1871.)

Geogr. Paleont., Bemerk. Halb. Mang. aleutischen Inseln, pp. 126, 127. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Atcha island, Alaska.

—— **evansi** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 84. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Moreau river, Nebr.

—— **haydeni** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 602, 603. St. Louis, 1856–1860. B. F. Shumard.

Formation: Cretaceous.

Location: Red river, Fannin county, Tex.

—— **haydeni** (Shumard) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 38, pl. 18, figs. 6*a*, *b*. Wash., 1883. C. A. White.

Nucula—Continued.

—— **monmouthensis** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 102, 103, pl. 11, fig. 1. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Marlboro and Haddonfield, N. J.

—— **obsoletastriata** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 275. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Great bend of the Missouri, Nebr.

—— **obsoletistriata** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 100, 101, pl. 15, figs. 10*c*, *d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Great bend of the Missouri.

—— **pectinata** (?) (Sow.) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 161, pl. 18, fig. 8. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Lower part of the Trent river.

—— **percrassa** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 327, pl. 35, fig. 4. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **percrassa** (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 318. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Pataula creek, Ga.

—— **percrassa** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 102, pl. 11, figs. 4–6. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Near Burlington, (?) N. J.

—— **perequalis** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 281. Phila., 1858–1860. T. A. Conrad.

Formation: Cretaceous.

Location: Eufaula, Ala.

—— **perequalis** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 104, 105. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: New Jersey (?).

—— **planimarginata** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 101, 102, pl. 15, fig. 8*a*, *b*., pl. 28, fig. 16. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river, Long lake, Butte au Grès, etc.

Nucula—Continued.

—— **planimarginata** (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 182. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of the Cache à la Poudre, the mouth of the Saint Vrains creek, and near Golden city, Colo.

—— **planimarginata** (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Golden city, Colo.

—— **planimarginata** (M. & H.) White. (1869.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 206. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colo.

—— **planimarginata** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 406, 407, pl. 11, figs. 5, 6. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, ten miles west of the mouth of Beaver creek, Black hills.

—— **planomarginata** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 85. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— **scitula** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 84. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— **serrata** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 603. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar county, Tex.

—— **slackiana** Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 318. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **slackiana** (Gabb) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 103, 104, pl. 11, figs. 2, 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Rev. G. C. Schanck's pits, near Marlboro, N. J.

—— **soltaria** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 197, pl. 32, fig. 94. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

Nucula—Continued.

—— **solitaria** (Gabb) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 232, 233, pl. 31, figs. 3, 3a. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay.

—— **subnasuta** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., pp. 384, 385, pl. 1, figs. 10, *a–e*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek.

—— **subplana** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 85. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above mouth, Nebr.

—— **subplana** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 99, 100, pl. 17, figs. 7*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from its mouth.

—— **traskana** n. s. Meek. [*1858.]

Trans. Albany Inst., vol. 4, p. 39. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— **traskana** Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 356. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— **truncata** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 198, 199, pl. 26, figs. 184, 184*a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, Butte county; Tuscan springs, Tehama county; Ranch of San Luis Gonzaga, east of Pacheco pass, Martinez, Cal.

—— **ventricosa** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 385, pl. 1, figs. 11*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek.

—— **(Acila) truncata** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 197. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Almost every locality of the Chico, Martinez, and Tejon groups, Cal.

—— **(Acila) truncata** (Gabb) Whiteaves. (1874.)

Geol. Sur. Can., Rep. Prog. for 1873–1874, pp. 264, 265. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

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[*] The date of this paper has been given by Meek as 1856 and 1857; by White as 1856, and by Marcou as 1857; 1858 is the earliest date of imprint on the volume.

Nucula—Continued.

—— **(Acila) truncata (Gabb) Whiteaves.** (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 162. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest side of Hornby island; Gabriola island; southwest side of Denman island; Nanaimo river, Vancouver island, two miles and a quarter up, and Protection island.

—— **(Acila) truncata (Gabb) Whiteaves.** (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 232. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: Bear Skin bay and bay east of Alliford bay, in Skidegate inlet.

—— **sp. undet. Morton.** (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 292. New Haven, 1833. S. G. Morton.

Formation: [Cretaceous.]

Location: Near Bordentown, N. J.

—— **sp. undet. Morton.** (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 65. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Vicinity of Bordentown, N. J.

—— **sp. undet. Whiteaves.** (1874.)

Geol. Sur. Can., Rep. Prog. for 1873–1874, p. 263. Montreal, 1874. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nanaimo river, Vancouver island, two and one-quarter and two and one-half miles up.

—— **sp. undet. Whiteaves.** (1876.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, p. 73. Montreal, 1876. J. F. Whiteaves.

Formation: Cretaceous.

Location: Queen Charlotte islands.

—— —— **? White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Bear river valley, Wyo.

Nuculana (Link) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 103, 104, Wash., 1876. F. B. Meek.

—— **bisulcata (M. & H.) Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 104, 105, pl. 15, fig. 4a, b. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Deer creek, near north branch of Platte river.

—— **bisulcata (M. & H.) Whitfield.** (1880.)

Rep. Geol. Black Hills of Dak., pp. 407, 408, pl. 11, fig. 7. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near Boxelder creek, and on the east fork of Beaver creek, Black hills.

Nuculana—Continued.

—— **compressifrons (Con.) Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 109, pl. 11, fig. 9. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **? equilateralis (M. & H.) Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 106, pl. 16, figs. 7a, b. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river.

—— **gabbana n. s. Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 106, 107, pl. 11, figs. 11-13. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Freehold, N. J.

—— **inclara n. s. White.** (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4 No. 3, pp. 708, 709. Wash., 1878. C. A. White.

Formation: Cretaceous.

Location: Danforth hills, near White River Indian agency, Colo.

—— **inclara White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 212. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Danforth hills, Colo.

—— **inclara White.** (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 60, 61, pl. 25, fig. 7a. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Danforth hills, near White River Indian agency, northwestern Colorado.

—— **longifrons (Con.) Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 107, 108, pl. 11, figs. 16, 17. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **pinnaformis (Gabb) Whitfield.** (1884.)

Mon. U. S. Geol. Sur., vol. 9, pp. 108, 109, pl. 11, figs. 7, 8. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **protexta Gabb.** (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 318. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Pataula creek, Ga.

—— **protexta (Gabb) Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 105, 106, pl. 11, fig. 10. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Crosswicks and Mullica hill, N. J.

—— **subequilatera n. s. Whitfield.** (1877.)

U. S. Geogr. and Geol. Sur., Rocky Mt. Region; Prelim. Rep. Paleont., Black Hills, p. 33. Wash., 1877. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near French creek.

Nuculana—Continued.

—— subequilatera Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 408, pl. 11, figs. 3, 4. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near French creek, Black hills.

—— subnasuta (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 105, 106, pl. 15, fig. 9. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri, below Fort Pierre.

Nucularia n. g. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 44. Phila., 1870. T. A. Conrad.

—— papyria n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 44, pl. 1, fig. 7. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— papyria Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 98, pl. 9, fig. 25. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— papyria (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 111, 112, pl. 11, figs. 18–20. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Nummulites Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 45. Phila., 1834. S. G. Morton.

—— mantelli n. s. Morton. (1833.)

Am. Jour. Sci., 1st. ser., vol. 23, p. 291, pl. 5, fig. 9. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Near Claiborne, Ala.

—— mantelli Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 45, 46, pl. 5, fig. 9. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Near Claiborne, Ala.

Obovaria (subgen. Raf.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Odontobasis ? n. g. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 351, 352. Wash., 1876. F. B. Meek.

—— buccinoidea n. s. White. (1876.)

Rep. Geol. Uinta Mts., p. 124. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Two miles west of Point of Rocks, Wyo.

—— buccinoides White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bitter creek valley, two miles west of Point of Rocks station, Wyo.

Odontobasis—Continued.

—— buccinoides White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 272. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Two miles west of Point of Rocks, Wyo.

—— buccinoides White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 102, 103, pl. 29, figs. 3a, b. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Two miles west of Point of Rocks station, Wyo.

—— constricta (H. & M. sp.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 352–354, figs. 41, 42, p. 353. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Deer creek, on the north branch of Platte river.

—— ? formosa n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 718, 719. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, northwestern Colorado.

—— ? formosa White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 213. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colo.

—— ? formosa White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 103, pl. 28, fig. 7a. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, near White river Indian agency, northwestern Colorado.

—— ventriosa n. s. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 354, pl. 19, figs. 1a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Cherry creek, near the mouth of Sage creek, Dak.

Œne n. g. Conrad. (1875.)

Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 9. T. A. Conrad.

—— plana n. s. Conrad. (1875.)

Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 9, pl. 1, fig. 17. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

Olcostephanus quatsinoensis n. s. Whiteaves. (1882.)

Proc. and Trans. Roy. Soc. Can., vol. 1, sec. 4, p. 82, fig. 1. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Forward inlet, Quatsino sound, Canada.

—— loganianus Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 211, 212, pl. 23, figs. 1, 1a. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay, in Skidegate inlet.

Oligoptych[a] subgen. Meek. (1876.)

Rep. U. S. Geol. Terr., vol. 9, p. 283. Wash., 1876. F. B. Meek.

Olivella (Swains) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 100. Phila., 1864. W. M. Gabb.

—— **mathewsonii n. s. Gabb.** (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 100, pl. 18, fig. 53. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Northeast of Martinez; also at Alizos creek, near Fort Tejon, Cal.

Omphalophacus ? tenellus Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 34. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Mississippi region.

Omphiscola (subgen. Raf.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 533. Wash., 1876. F. B. Meek.

Ophioderma White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 8. Wash., 1883. C. A. White.

—— **? bridgerensis (Meek) White.** (1882.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 8, 9, pl. 12, fig. 12a. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: "Last foot of Bridge peak, four miles north of Fort Ellis, Mont."

Opis (Defr.) Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 327. Phila., 1855-1858. T. A. Conrad.

—— **(Defr.?) Gabb.** (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 311. Phila., 1876. W. M. Gabb.

—— **bella n. s. Conrad.** (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 327. Phila., 1855-1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **bicarinata n. s. Conrad.** (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser. 1855-1858, p. 327. Phila., 1855-1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **conradi Gabb.** (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 311. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

—— **vancouverensis n. s. Whiteaves.** (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 158-160, pl. 18, figs. 4, 4a. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Southwest side of Denman island.

Opis—Continued.

—— **vancouverensis Whiteaves.** (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser., 1886, App. I, p. 112 B. Montreal, 1887. J. F. Whiteaves.

Formation: Cretaceous.

Location: West end of Lasqueti island (in the strait of Georgia) near False bay.

—— **vancouverensis Whiteaves.** (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 155. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: West end of Lasqueti island (in the strait of Georgia) near False bay.

Orbitulites texanus n. s. Roemer. (1849.)

Tex. p. 392. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: On road from New Braunfels to Fredericksburg, Tex.

—— **texanus Roemer.** (1852.)

Kreide von Tex. p. 86, Taf. 10, figs. 7a-d. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Wasp creek, on road from New Braunfels to Fredericksburg, and upper course of the Pedernales river, Tex.

Orthoceras (Brug.) Gabb. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 6. Phila., 1870. W. M. Gabb.

—— **blakei Gabb.** (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 6. Phila., 1870. W. M. Gabb.

Formation: Triassic.

Location: Nevada.

—— **blakei (Gabb?) Meek.** (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 104, 105, pl. 10, fig. 11. Wash., 1877. F. B. Meek.

Formation: Triassic.

Location: Ridge above Cottonwood canyon, West Humboldt range.

Orthoceratites (Brey.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 19. Phila., 1864. W. M. Gabb.

—— **blakei n. s. Gabb.** (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 19, pl. 3, fig. 1. Phila., 1864. W. M. Gabb.

Formation: Triassic.

Location: Buena Vista district, Humboldt mining region.

Ostrea [Linn.] Say. 1820.

Am. Jour. Sci., 1st ser., vol. 2, p. 42. New Haven, 1820. Thomas Say.

—— **acuticosta n. s. N. & G.** (1840.)

Bull. Roy. Acad. Sci. Bruxelles, Tome 7, pt. 2, pp. 213, 214, fig. 2. Bruxelles, 1840. Nyst & Galeotti.

Formation: Jurassic.

Location: Tehuacan, Mexico.

Ostrea—Continued.

—— **acutirostris** (Nilsson) Troost. (1840.)

Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840. G. Troost.

Formation: Cretaceous.

Location: McNairy county, Tenn.

—— **acutirostris** (Nils.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 227. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Near Woodbury, N. J.

—— **acutirostris** (Nils.) n. var. Eichwald. (1871.)

Geogr.-Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 134, 135. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaskan peninsula.

—— **americana** (Deshayes) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 291. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **anomiæformis** n. s. Roemer. (1849.)

Tex. p. 394. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Ford and waterfall near New Braunfels, Tex.

—— **anomiæformis** Roemer. (1852.)

Kreide von Tex. p. 75, Taf. 9, figs. 7*a–d*. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Ford and waterfall of the Guadalupe near New Braunfels, Tex.

—— **anomiæformis** (Roemer) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 31, pl. 4, figs. 9–13. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: New Braunfels, Tex.

—— **anomiæformis** (Roemer) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 291. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **anomioides** n. s. Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 488. Wash., 1873. F. B. Meek.

Formation: Cretaceous.

Location: Missouri river, below Gallatin city, Mont.

—— **anomioides** (Meek) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 10, 11, pl. 11, figs. 4, *a*, *b*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Missouri river, below Gallatin city, Mont.

Ostrea—Continued.

—— **anomioides** (Meek) White. (1884

Fourth Ann. Rep. U. S. Geol. Sur., p. 291, pl. 3 figs. 4, 5. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **appressa** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 203, 204, pl. 3 fig. 104, 104*a*. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: One of the branches of Eel river, at the mouth of Salt creek, southwest of Round valley, Mendocino county, Cal.

—— **appressa** (Gabb) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., pp. 291, 292, pl. 39, fig. 9. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: California.

—— **arietina** (d'Orb.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 42, pl. 5, figs. 10–13. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Waco camp, Mission hills, New Braunfels, and Leon springs, Tex.

—— **barrandei** n. s. Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 47, pl. 12, figs. 1–4. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: New Jersey.

—— **barrandei** (Coquand) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., pp. 292, 293, pl. 44, figs. 1, 2; pl. 45, fig. 2, pl. 46, fig. 1. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: New Jersey?.

—— **bella** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 156, pl. 10, figs. 4*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Western Texas.

—— **bella** (Con.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 61, pl. 32, figs. 7, 8. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Canada, Texas, and Mexico.

—— **bella** (Con.) White. (1884)

Fourth Ann. Rep. U. S. Geol. Sur., p. 292, pl. 39, fig. 6. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **bellaplicata** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 608, 609, St. Louis, 1856–1860. B. F. Shumard.

Formation: Cretaceous.

Location: Near Sherman, in the bluffs of Post Oak creek, and various other localities in Grayson county, Tex.

—— **belliplicata** (Shum.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 292, pl. 47, figs. 1–3. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Texas.

Ostrea—Continued.

— (Alectryonia) belliplicata (Shum.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 276, 277, pl. 4, figs. 3*a*, *b*; pl. 8, figs. 2*a*, *b*. Wash., 1879. C. A. White.
Formation. Cretaceous.
Location: Near Sherman, in the bluffs of Post Oak creek, and various other localities in Grayson county (Tex.), Denison, Tex.

— bellarugosa (Shum.) White. (1883.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 292. Wash., 1884. C. A. White.
Formation: Cretaceous.

— blackii White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 292, pl. 45, fig. 1; pl. 46, fig. 2. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

— brewerii n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 204, pl. 26, fig. 191. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cow creek, Shasta county, Cal.

— brewerii (Gabb) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, pp. 61, 62, pl. 32, fig. 10. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Cow creek, Shasta county, Cal.

— brewerii (Gabb) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 293. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: California.

— bryani n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 321, Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Near Vincentown, N. J.

— bryani (Gabb) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 293. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: New Jersey.

— carinata (Lam.) Roemer. (1849.)

Tex., p. 394, Bonn., 1849. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, near New Braunfels, Tex.

— carinata (Lam.) Roemer. (1852.)

Kreide von Tex., p. 75, Taf. 9, fig. 5. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, on the Guadalupe above New Braunfels, Tex.

— carinata (Lam.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 156, pl. 10, fig. 6. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Turkey creek; Las Minas, New Braunfels.

Ostrea—Continued.

— carinata (Lam.) (Roemer.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 293, pl. 43, figs. 1-4. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

— coalvillensis (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 233. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

— coalvillensis (Meek) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 293, pl. 36, figs. 1-4. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

— confragosa n. s. Conrad. (1858).

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 329, pl. 34, fig. 4. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

— confragosa (Con.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 293. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Mississippi.

— congesta n. s. Conrad. (1843.)

Rep. Hydrog. Basin Upper Mississippi river, I. N. Nicollet. App. C, p. 169. Wash., 1843. T. A. Conrad.
Formation: Cretaceous.
Location: On the Missouri river.

— congesta (Con.) Hall. (1856.)

Rep. Expl. and Sur. R. R. Mississippi river to Pacific ocean, vol. 3, pt. 4, p. 100, pl. 1, fig 11. Wash., 1856. James Hall.
Formation: Cretaceous.
Location: Three miles north of Galisteo; from marls on the Missouri; Missouri river, twenty-six miles above the mouth of l'Eau qui Court.

— congesta (Con.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 49, pl. 17, fig 5. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Arkansas, New Mexico, and on the Missouri.

— congesta (Con.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 13, 14, pl. 9, figs 1*a*-*f*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: At numerous places along the Missouri between the Big Sioux and the Great bend; also on Little Blue river, near the Kansas and Nebraska line, and near the Black hills, on Cheyenne river, as well as on the North Platte, in the Niobrara group. It likewise occurs at several localities in New Mexico and Colorado.

Ostrea—Continued.

—— **congesta** (Conrad) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— **congesta** (Conrad.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 233, 234, Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **congesta** (Con.) White. 1884.
Fourth Ann. Rep. U. S. Geol. Sur., p. 294, pl. 39, figs. 11, 13. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **congesta** (Con.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 78, 79. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky Spring ridge, near MacLeod Benton trail; west flank of West butte, in the Sweet Grass hills, and close to the international boundary line.

—— **congesta** (Con.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 83. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Waterton river, a few miles below the lake, Canada.

—— **congesta** (Con.) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 186, 187. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Swan river; Ocre river, township 23, range 17, west; and township 22 in the same range; Vermilion river, township 24, range 17, west; and township 25 in the same range; Rolling river, two miles above the old C. P. R. crossing, and Swan river, township 35, range 29, west; Thunder hill, township 35, range 30, west; Assiniboine river, section 36, township 8, range 11, west, Manitoba.

—— **convexa** n. s. Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, pp. 42, 43. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: Near Burlington, N. J., and at Mullica hill, same State.

—— **convexa** (Say) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 294. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **cortex** (Con.) Coquand. (1869.)
Monog. Genre Ostrea Terrain Créatcé, pp. 64, 65, pl. 34, figs. 11-14. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Dry creek, Mexico.

—— **cortex** (Con.) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, p. 170, pl. 15, figs. 2a-c. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Colob plateau, southwest of Kanara, and also at the North fork of Virgin river, Utah.

—— **cortex** (Con.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 294, pl. 37, figs. 3, 4. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Dry creek, Mexico.

—— **crenulata** (Tuomey) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 294. Wash., 1884 C. A. White.
Formation: Cretaceous.

—— **crenulimarginata** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 398, pl. 68, figs. 40, 41. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Two miles east of Middleton, Tenn.

—— **crenulimarginata** (Gabb) Coquand. (1869.)
Mono. Genre Ostrea Terrain Crétacé, p. 51, pl. 17, figs. 12, 13. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Tennessee.

—— **crenulimarginata** (Gabb) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 294, pl. 40, fig. 2. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Tennessee.

—— **crenulimarginata** (Gabb) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 30, pl. 3, figs. 10, 11. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Marlboro, N. J.

—— **crenulimargo** n. s. Roemer. (1852.)
Kreide von Tex., p. 76, Taf. 9, figs. 6a, b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **crenulimargo** (Roemer) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, pp. 55, 56, pl. 25, figs. 7, 8. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **crenulimargo** (Roemer) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 294, pl. 33, figs. 8, 9. Wash. 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

Ostrea—Continued.

—— cretacea n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 52, pl. 19, fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Erie, Greene county, Ala.; South Carolina.

The South Carolina specimen is probably Tertiary, ut the Alabama specimen is undoubtedly Cretaceous.

—— cretacea (Mort.) Owen. (1860.)
Second Rep. Geol. Rec. Ark., pl. 8, fig. 8. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— cretacea ? (Mort.) Owen. (1860.)
Second Rep. Geol. Rec. Ark., pl. 7, fig. 7. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— cretacea (Mort.) Owen. (1860.)
Second Rep. Geol. Rec. Ark., pl. 7, figs. 3*a*, *b*. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— cretacea (Morton) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 328. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, N. J.

—— cretacea (Morton) Coquand. (1869.)
Monog. Genre Ostrea Terrian Crétacé, p. 52, pl. 23, figs. 4, 5. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Greene county, and Prairie bluff, Ala.; Erie, Ark.

—— cretacea (Morton) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., pp. 294, 295. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Arkansas.

— cristagalli ? [Schlot.] Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 284. New Haven, 1830. S. G. Morton.
Formation: [Cretaceous.]
Location: [St. Georges, Del.]

— cristagalli ? [Schlot.] Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 22. New Haven, 1830. S. G. Morton.

— denticulifera n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 330, pl. 34, figs. 1, 8. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

— denticulifera (Con.) Coquand. 1869.)
Monog. Genre Ostrea Terrain Crétacé, p. 50, pl. 17, figs. 8, 9. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Alabama, Missouri, and Tennessee.

Ostrea—Continued.

—— denticulifera (Con.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 295. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Mississippi.

—— denticulifera (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 29, pl. 3, figs. 8, 9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— diluviana (Linn.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 295, pl. 40, fig. 1, pl. 41, figs. 1, 2. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Bell county, Tex.

—— elegantula (Newberry) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 295, pl. 36, figs. 5–7. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Valley of Canadian river.

—— engelmanni n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 311. Phila., 1861. F. B. Meek.
Formation: Jurassic.
Location: Red buttes, on the North Platte, latitude 42° 50′, longitude 106° 40′ west.

—— engelmanni Meek. (1876.)
Rep. Expl. Great Basin Terr., Utah, pp. 355, 356, pl. 3, fig. 6. Wash., 1876. F. B. Meek.
Formation: Jurassic.
Location: Red buttes, on the North Platte, latitude 42° 50′, longitude 106° 40′ west.

—— engelmanni (Meek) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 73, 74. figs. A and B. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Red buttes, on north branch of Platte river, Dak. Ter., latitude 42° 50′, longitude 106° 40′ west.

—— engelmanni (Meek) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 289, pl. 34, figs. 3, 4. Wash., 1884. C. A. White.
Formation: Jurassic.
Location: Eastern portion of Wyoming.

—— exogyrella n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 322, 323. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek and Georgetown, Ga.

—— exogyrella (Gabb) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 296. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Georgia.

Ostrea—Continued.

—— **falcata n. s. Morton. (1827.)**

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 50, 51, pl. 1, fig. 2. Phila., 1827-1831. S. G. Morton.

Formation: Cretaceous.

Location: Delaware and Chesapeake canal, near St. Georges.

—— **falcata Morton. (1830.)**

Am. Jour. Sci., 1st ser., vol. 17, p. 284. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: St. Georges, Delaware; many parts of New Jersey.

—— **falcata Morton. (1830.)**

Am. Jour. Sci., 1st ser., vol. 18., pl. 3, figs. 19, 20. New Haven, 1830. S. G. Morton.

—— **falcata Morton. (1834.)**

Synop. Org. Rem. Cret. Gr. U. S., pp. 50, 51, pl. 3, fig. 5; pl. 9, figs. 6, 7. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: St. Georges, Del.; Catawba, Ala.; Prairie bluff, on the Alabama river; Shrewsbury, N. J.

—— **falcata ? (Mort.) Troost. (1840.)**

Fifth Geol. Rep. Tenn., pp. 45, 46. Nashville, 1840. G. Troost.

Formation: Cretaceous.

Location: Near Purdy, McNairy county, Tenn.

—— **falcata (Mort.) Owen. (1860.)**

Second Rep. Geol. Rec. Ark., pl. 7, fig. 5. Phila., 1860. D. D. Owen.

Formation: Cretaceous.

Location: Arkansas.

—— **falcata (Morton) White. (1884.)**

Fourth Ann. Rep. U. S. Geol. Sur., p. 296. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **falcata var. mesenterica n. var. Morton. (1833.)**

Am. Jour. Sci., 1st ser., vol. 24, pl. 9, fig. 7. New Haven, 1833. S. G. Morton.

—— **falcata var. nasuta n. var. Morton. (1833.)**

Am. Jour. Sci., 1st ser., vol. 24, pl. 9, fig. 6. New Haven, 1833. S. G. Morton.

—— **ferdinandi n. s. Coquand. (1869.)**

Monog. Genre Ostrea Terrain Crétacé, pp. 33, 34, pl. 5, figs. 14, 15. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Leon springs and New Braunfels, Tex.

—— **flabellula (Lam.) Troost. (1840.)**

Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840, G. Troost.

Formation: Cretaceous.

Location: McNairy county, Tenn.

—— **fragosa (Con. sp.) Coquand. (1869.)**

Monog. Genre Ostrea Terrain Crétacé, p. 53, pl. 23, figs. 6, 7. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Between El Paso and Frontera, Tex.

Ostrea—Continued.

—— **franklini n. s. Coquand. (1869.)**

Monog. Genre Ostrea Terrain Crétacé. p. 53, pl. 23, figs. 8-10. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Arkansas.

—— **franklini (Coquand) White. (1884.)**

Fourth Ann. Rep. U. S. Geol. Sur., p. 296, pl. 39, figs. 1-3. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Arkansas.

—— **franklini (Coquand) Hill. (1888.)**

Ann. Rep. Geol. Sur. Ark., for 1888, vol. 2, pp. 131-133, pl. 5, figs. 1-18a; pl. 6, figs. 19-25, pl. 7. figs. 28-30. Little Rock, 1888. R. T. Hill.

Formation: Cretaceous.

Location: Vicinity of Murfreesboro, Pike county, Ark., junction of Little Missouri river and the Muddy fork.

—— **gabbana n. s. M. & H. (1861.)**

Proc. Acad. Nat. Sci., Phila., for 1861, p. 440. Phila., 1862. Meek & Hayden.

Formation: Cretaceous.

Location: Head of Gros Ventre river, Nebr.

—— **gabbana (M. & H.) White. (1884.)**

Fourth Ann. Rep. U. S. Geol. Sur., p. 296. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **glabra n. s. M. & H. (1857.)**

Proc. Acad. Nat. Sci., Phila. for 1857, pp. 146, 147. Phila., 1858. Meek & Hayden.

Formation: Cretaceous.

Location: Mouth of Judith river, Nebr.

—— **glabra (M. & H.) Meek. (1876.)**

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 509, 510, pl. 40, figs. 2*a*-*d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Judith river, Mont.

—— **glabra (M. & H.) White. (1879.)**

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 167, 168. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Crow creek valley, Colo.

—— **glabra (Meek) White. (1879.)**

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 190. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Valley of Bijou creek, Colo.

—— **glabra (M. & H.) White. (1879.)**

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 208. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Yampa valley near Canyon park, Colo.

—— **glabra (M. & H.) White. (1879.)**

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Rock springs, Wyo.

Ostrea—Continued.

—— glabra (M. & H.?) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Bitter creek valley, two miles west of Point of Rocks station, Wyo.

—— glabra (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 216. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Point of Rocks station, Wyo.

—— glabra (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 217, 218. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Point of Rocks and Black buttes station, Wyo.; eastern Colorado, Bear river valley.

—— glabra (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 15, pl. 10, figs. 1–5. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of the South Platte, Colo.

—— glabra (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 15, pl. 11, figs. 1–4. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Point of Rocks, Wyo.

—— glabra (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 15, pl. 12, fig. 1. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Point of Rocks, Wyo.

—— glabra (M. & H.) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 56. Wash., 1883. C. A. White.

Formation: Cretaceous.

—— glabra (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 15, pl. 9, figs. 1–4. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Valley of the South Platte, Colo.

—— glabra (M. & H.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., pp. 307, 308, pls. 58–60. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— glabra (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont., Can. Paleont., vol. 1, p. 64. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: South Saskatchewan, one mile below the mouth of the Bow river; also South Saskatchewan, six miles below the mouth of the Bow river, and north bank of the Milk river, five miles below Pa-Kow-Ki coulee, and south bank of Milk river, above Pa-Kow-Ki coulee, Canada.

Ostrea—Continued.

—— glabra (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 56. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Near Bull's head; Saskatchewan coal mines, near Medicine hat, Canada.

—— glabra (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 5. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Bow river, mouth of East Arrowwood creek; Upper Belly river, twenty-three miles above the mouth of the Waterton; forks of Devil's Pine and Three Hills creeks; also Red Deer river, near eighth correction line; Oyster creek, northwest branch of the north fork of the Old Man river.

—— glandiformis n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 205, 206, pl. 27, figs. 1–5. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Farmingdale; Squankum; Shark river, near New Egypt; near Vincentown, N. J.

—— idraensis n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 203, pl. 33, figs. 103, *b–d*; pl. 34, figs. 103, 103*a*. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: About two miles east of the Hacienda at New Idria, Cal.

—— idriaensis (Gabb?) Meek. (1872.)

Fifth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 375. Wash., 1872. F. B. Meek.

Formation: Cretaceous.

Location: Point of Rocks, Wyo.

—— idriaensis (Gabb) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 296, pl. 34, figs. 7, 8. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: California.

—— inornata n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, pp. 181, 182. Phila., 1861. Meek & Hayden.

Formation: Cretaceous.

Location: Great bend of the Missouri, below Fort Pierre, Nebr.

—— inornata (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 14, pl. 10, fig. 4. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Great bend of the Missouri, below Fort Pierre.

—— inornata (Meek) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 296. Wash., 1884. C. A. White.

Formation: Cretaceous.

Ostrea—Continued.

—— **inornata** (M.& H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 30. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: St. Mary river, near its confluence with the Belly river, Canada.

—— **insecura** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 112, 113. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Two miles west of Point of Rocks, Wyo.

—— **larva** (Lam.) Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: McNairy county, Tenn.

—— **larva** (Lam.) Cook. (1868.)
Ann. Rep. Geol. Sur., New Jersey, for 1868, p. 375, fig. on, p. 375. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

—— **larva** (Lam.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 226, 227. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Woodbury, Marlboro, Nut swamp, N. J.

—— **larva** (Lam.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 320. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Georgetown, Quitman county, Ga.

—— **larva** (Lam.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 34-36, pl. 3, figs. 3-7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Throughout New Jersey.

—— **larva** (Lam.) Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 6. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Manor, Travis county, Tex.

—— **lateralis** (Nilsson) Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: McNairy county, Tenn.

—— **lateralis** (Nils. sp.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 228. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Eatontown and Timber creek, N. J.

—— **lateralis** (Nilsson) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 297. Wash., 1884. C. A. White.
Formation: Cretaceous.

Ostrea—Continued.

—— **littlei** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 321, 322. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek and Georgetown, Ga.

—— **littlei** (Gabb) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 297. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Georgia.

—— **lugubris** n. s. Conrad. (1857.)
Rep. U. S. Mex. Bound. Sur., vol. 1, pt. 2, p. 156, pl. 10, fig. 5. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: East of Red river (Canadian), N. Mex., Santa Fe road.

—— **lugubris** (Con.) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, p. 66, pl. 36, figs. 22, 23. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Texas, east of Red river; and New Mexico.

—— **lugubris** (Con.) Meek. (1876.)
Rep. Expl. Exped. Santa Fé, N. Mex., to junction, of Grand and Green rivers, pp. 123, 124, pl. 1, figs. 1*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Banks of the Canadian, Va do del Chama, Galisteo, Pagosa, N. Mex.

—— **lugubris** (Con.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 297, pl. 41, fig. 3. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Colorado and New Mexico.

—— **lunata** (Nils.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 227. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Near Eatontown, N. J.

—— **lyoni** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 200, 201. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Pine bluff, Red river county, Tex.

—— **lyoni** (Shum.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 297. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

—— **malleiformis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1. p. 204, pl. 31, fig. 272. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Siskiyou mountains, in California and Oregon; Jacksonville, Oregon.

—— **malleiformis** (Gabb) Coquand. (1869.)
Monog. Genre Ostrea Terrian Crétacé, p. 60, pl. 32, fig. 4. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Siskiyou mountains, Jacksonville, Oregon; and California.

Ostrea—Continued.

—— **malleiformis (Gabb) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 297, pl. 50, fig. 7. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: California.

—— **marshii (Sow.) Marcou. (1858.)**
Geol. N. Am., pp. 43, 44, pl. 4, fig. 4. Zurich, 1858. Jules Marcou.
Formation: Jurassic [Cretaceous?].
Location: Pyramid mount.

—— **mesenterica (Mort.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 297. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **mortoni (Gabb) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 297. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **multilirata (Con.) Coquand. (1869.)**
Monog. Genre Ostrea Terrian Crétacé, p. 63, pl. 33, figs. 1-4. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Dry creek, Mexico; and Texas.

—— **multiradiata (Con.) White. (1883.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 298, pl. 38, figs. 1, 2. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **nasuta (Mort.) White. (1883.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 298. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **owenana n. s. Shumard. (1861.)**
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 200. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield Point, Navarro county, Tex.

—— **owenana (Shum.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 298. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

—— **panda n. s. Morton. (1833.)**
Am. Jour. Sci., 1st ser., vol. 23, p. 293. New Haven, 1833. S. G. Morton.
Formation: [Cretaceous].
Location: New Jersey.

—— **panda Morton. (1834.)**
Synop. Org. Rem. Cret. Gr. U. S., pp. 51, 52, pl. 3. fig. 6; pl. 19, fig. 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: St. Georges, Del.; South Carolina; Alabama.

—— **panda (Morton) Gabb. (1861.)**
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 328, 329. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Tennessee.

Ostrea—Continued.

—— **panda (Morton) Coquand. (1869).**
Monog. Genre Ostrea Terrain Crétacé, pp. 57, 58, pl. 30, figs. 8, 9. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Jersey and Alabama.

—— **panda (Mort.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 298. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **panda (Mort.) Whitfield. (1885.)**
Mong. U. S. Geol. Sur., vol. 9, p. 30. Wash., 1885. R. P. Whitfield.
Formation: Tertiary [Cretaceous?].

—— **pandæformis n. s. Gabb. (1861.)**
Proc. Acad. Nat. Sci., Phila., for 1861, p. 328. Phila., 1862. W. M. Gabb.
Formation: Cretaceous?
Location: "Seven miles below Yazoo," Miss.

—— **pandæformis (Gabb.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p. 298. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Mississippi.

—— **patina n. s. M. & H. (1856.)**
Proc. Acad. Nat. Sci., Phila., for 1856, p. 277. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Two hundred miles above the mouth of Milk river, Nebr.

—— **(Gryphæa ?) patina (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 16-18, pl. 10, figs. 2*a*, *b*., (bis.) and 3*e*, *f*; also pl. 11 (varieties). Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Two hundred miles above the mouth of Milk river on the Missouri.

—— **patina (M. & H.) White. (1879.)**
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 180. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fossil ridge, Colo.

—— **patina (M. & H.) White. (1884.)**
Fourth Ann. Rep. U. S. Geol. Sur., p, 298, pl. 47, figs. 4-6. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **patina (M. & H.) Whiteaves. (1885.)**
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 30. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: White Mud river (sometimes called Frenchman's creek), near the forty-ninth parallel and south of Woody mountain, Canada.

—— **pellucida (M. & H.) Meek. (1876.)**
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 15, pl. 28, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Long lake and Moreau river.

Ostrea—Continued.

—— pellucida (M. & H.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 299, pl. 50, figs. 6, 7. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— pectinata (Lam.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, pp. 76–79, pl. 29, figs. 1–7. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Turkey creek, Las Minas, and New Braunfels, Tex.

—— peculiaris n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 329, pl. 34, fig. 7. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— peculiaris (Con.) Coquand. (1896.)

Monog. Genre Ostrea Terrain Crétacé, pp. 49, 50, pl. 17, figs. 6, 7. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Alabama.

—— peculiaris (Con.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 298. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Mississippi.

—— pitcheri [Morton sp.] Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 40, pl. 9, figs. 9–12; pl. 12, figs. 5, 6. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Braunfels, Leon springs, and Cross timbers, Tex., Fort Washita, Preston, and in Arkansas and New Mexico.

—— planovata n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 201. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Navarro county, near Dresden, Tex.

—— planovata (Shum.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 299. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

—— plumosa n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 293. New Haven, 1833. S. G. Morton.
Formation: [Cretaceous].
Location: New Jersey.

—— plumosa Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 51, pl. 3, fig. 9. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Arneytown, N. J.

—— plumosa (Morton) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 61, pl. 32, fig. 9. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Jersey, Alabama, and Missouri.

Ostrea—Continued.

—— plumosa (Morton) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 298, pl. 37, figs. 5, 6. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: New Jersey.

—— plumosa (Morton) Whitfield. (1885.)

Mong. U. S. Geol. Sur., vol. 9, pp. 31, 32, pl. 3, figs. 12, 13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Arneytown, N. J.

—— prudentia n. s. White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of one hundredth meridian, vol. 4, pt. 1, p. 171, pl. 14, figs. 2*a*–*d*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: East of Impracticable ridge, Utah.

—— prudentia White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 299, pl. 40, figs. 5, 6. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Southern Utah.

—— pusilla (Nils.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 321. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Georgetown, Pataula creek, and five miles north of Lumpkin, Stewart county, Ga.

—— quadriplicata n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 608. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Upper part of the bluffs of Red river, Lamar county, and ten miles above the mouth of Kiamesha creek, Tex.

—— quadriplicata (Shumard) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 275, 276, pl. 5, fig. 6*a*; pl. 8, figs. 3*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar county, Tex.; Denison, Tex.

—— quadriplicata (Shumard) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., pp. 299, 300, pl. 43, figs. 5–7. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Texas.

—— radians (Conrad) Morton. (1833).

Am. Jour. Sci., 1st ser., vol. 24, p. 130. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary?].
Location: Southern States.

—— robusta n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 156, 157, pl. 11, figs. 3*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous [Tertiary].
Location:* Jacun, three miles below Laredo.

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* Mistake. This locality is Tertiary.

Ostrea—Continued.

—— **robusta** (Conrad) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, p. 62, pl. 32, figs. 11, 12. Marseilles, 1869. H. Coquand.
Formation: Cretaceous [Tertiary].
Location: *Jacun, three miles from Laredo, Tex.

—— **robusta** (Conrad). (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 300, pl. 40, figs. 3, 4. Wash., 1884. C. A. White.
Formation: Cretaceous [Tertiary].
Location: Near Laredo, Tex. [?]

—— **sandalina** (Goldf.) Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 46. Nashville, 1840. G. Troost.
Formation: Cretaceous.
Location: McNairy county, Tenn.

—— **sellæformis** (Conrad) Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Southern States.

—— **sellæformis** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 52. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Alabama and South Carolina.

—— **serrata** (Defr.) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, pp. 79, 80, pl. 17, fig. 3; pl. 30, fig. 1-5. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Jersey.

—— **similis** n. s. N. & G. (1840.)
Bull. Roy. Acad. Sci. Bruxelles, Tome 7, pt. 2, p. 214, fig. 5. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehuacan, Mexico.

—— **skidegatensis** nom. prov. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mess. Foss., vol. 1, pt. 2, pp. 243, 244, pl. 32, fig. 1; pl. 12, p. 242. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skidegate inlet, south side of Alliford bay; Skidegate inlet, west side of Alliford bay.

—— **skidegatensis** Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 165. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— **soleniscus** n. s. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 430 Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: With coal-bed, Bear River city.

—— **soleniscus** Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 487, 488. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Near Coalville, Utah; Bear River city, Wyo.

—— **soleniscus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 233. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **soleniscus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 249. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyo.

—— **soleniscus** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 9, 10. pl. 11, figs. 2*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Coalville, Utah; Bear River city, Wyo.; a few miles east of Bear River city, Wyo.

—— **soleniscus** (Meek) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 300, pl. 42, fig. 1. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Southern Wyoming and adjacent parts of Utah and Colorado.

—— **strigilecula** n. s. White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 163, 164, pl. 13, figs. 3*a*, *d*. Wash., 1875. C. A. White.
Formation: Jurassic.
Location: Two miles south of Dirty Devil river, Utah.

—— **strigilecula** (White) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 348, 349, pl. 3, figs. 8, 12. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: East of the Belle Fourche river; Sun Dance hill, and near Beaver creek, Black hills.

—— **strigilecula** White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., pp. 289, 290, pl. 35, figs. 9, 11. Wash., 1884. C. A. White.
Formation: Jurassic.
Location: Wyoming, Colorado, Utah, Idaho.

—— **subalata** (Meek) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 300, pl. 39, fig. 10. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **subovata** n. s. Shumard. (1853.)
Expl. Red River, La., by R. B. Marcy, pp. 205, 206, pl. 5, fig. 2. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Fort Washita, Ind. Terr.

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* Mistake. This locality is Tertiary.

Ostrea—Continued.

—— **subovata** (Shum.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, pp. 48, 49, pl. 17, fig. 4. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Texas, Arkansas, and Fort Washita.

—— **subovata** (Shum.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 301. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **subfimbriata** n. s. Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 60, pl. 32, figs. 5, 6. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Texas.

—— **subspatulata** n. s. Forbes. (1844.)

Quart. Jour. Geol. Soc. London, vol. 1, pp. 61, 62, figs. on pp. 61, 62. London, 1845. Edward Forbes.

Formation: Cretaceous.

Location: Lewis creek; south Washington; North Carolina.

—— **subspatulata** (Lyell Sow.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1. pt. 2, pp. 155, 156, pl. 10, figs. 3*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Western Texas.

—— **subspatulata** (Sow.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 43, pl. 15, fig. 3. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Lewis creek; North Carolina; Texas Alabama; New Jersey; and Missouri.

—— **subspatulata** (Fbs.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 320. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Five miles north of Lumpkin, Stewart county, and near Fort Gaines, Ga.

—— **subspatulata** (Forbes) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 301, pl. 37, figs. 1, 2. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: New Jersey.

—— **subspatulata** (L. & S.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 32, 33, pl. 3, fig. 14. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Shrewsbury, N. J.

—— **subtrigonalis** n. s. E. & S. (1857.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 40. St. Louis, 1856–1860. Evans & Shumard.

Formation: Cretaceous.

Location: Vicinity of Owl butte, between Moreau and Grand rivers.

Ostrea—Continued.

—— **subtrigonalis** (E. & S.?) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 510, pl. 40, figs. 1*a*–*d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Judith river, Mont.

—— **subtrigonalis** (E. & S.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 308, pl. 61, figs. 4–7. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Upper Missouri river region.

—— **subtrigonalis** (E. & S.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 15, pl. 12, figs. 2–5. Wash., 1883. C. A. White.

Formation: Cretaceous.

—— **subtrigonalis** (E. & S.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 83. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous or Laramie.

Location: Middle Fork of the Old Man river, about two miles above the mouth of the North fork, Canada.

—— **subtrigonalis** (E. & S.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 56. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Woodworth Mine, Medicine Hat, Canada.

—— **subtrigonalis** (E. & S.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 30. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Banks of the Belly river at the mouth of the St. Mary river; Milk River ridge, Canada.

—— **subtrigonalis** (E. & S.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 5, 6. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Rye Grass flat, Old Man river; Upper Belly river, twenty-two miles above the mouth of the Waterton, Canada.

—— **tecticosta** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 403, pl. 68, figs. 47, 48. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Tennessee and New Jersey.

Ostrea—Continued.

—— **tecticosta** (Gabb) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, p. 50, pl. 17, figs. 10, 11. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Jersey and Tennessee.

—— **tecticostata** (Gabb) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 301, pl. 50, figs. 4, 5. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Tennessee and New Jersey.

—— **tecticosta** (Gabb) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 33, 34, pl. 3, figs. 1, 2, Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Vicinity of Trenton, N. J.?

—— **texana** [Roem. sp.] Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, p. 42, pl. 9, figs. 4–8. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Braunfels, Tex., between El Paso and Frontera, Mexico.

—— **torosa** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24, p. 130, pl. 10, fig. 1. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **torosa** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 52, pl. 10, fig. 1. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Mullica hill, N. J.

—— **torosa** (d'Orb.) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, pp. 38, 39, pl. 9, figs. 1–3; pl. 14, figs. 1–4; pl. 15, figs. 1, 2. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Braunfels, Tex.; Delaware, New Jersey, Alabama, South Carolina, Tennessee, Arkansas, and Missouri.

—— **torosa** (Morton) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 301. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **translucida** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 147. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Long lake on the Missouri, Nebr.

—— **translucida** (M. & H.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 301. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **tuomeyi** n. s. Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, p. 68. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Alabama.

—— **tuomeyi** (Coquand) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., pp. 301, 302. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: Alabama.

Ostrea—Continued.

—— **uniformis** (Meek) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 302, pl. 48, figs. 6–7. Wash., 1884. C. A. White.
Formation: Cretaceous.
Location: New Mexico.

—— **ungulata** (Schlot.) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, pp. 58, 60, pl. 31, figs. 4–15. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: Delaware, Alabama, New Jersey, Missouri.

—— **urticosa** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 293. New Haven. S. G. Morton.
Formation: [Cretaceous].
Location: New Jersey.

—— **urticosa** Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24, pl. 10, fig. 2. New Haven, 1833. S. G. Morton.

—— **vellicata** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 156, pl. 11, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Rio Grande, between El Paso and Frontera.

—— **vellicata** (Con.) White. (1884.)
Fourth Ann. Rep. U. S. Geol. Sur., p. 302. Wash., 1884. C. A. White.
Formation: Cretaceous.

—— **vesicularis** (Lam.) Owen. (1860.)
Second Rep. Geol. Rec., Ark., pl. 8, fig. 6. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— **vesicularis** (Lam.) Coquand. (1869.)
Monog. Genre Ostrea Terrain Crétacé, pp. 35, 36, pl. 13, figs. 2–10. Marseilles, 1869. H. Coquand.
Formation: Cretaceous.
Location: New Braunfels, Tex., and New Jersey.

—— **vesicularis** (Lam.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, pp. 225, 226. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **vesicularis** var. **aucella** n. var. Roemer. (1852.)
Kreide von Tex., pp. 74, 75, Taf. 9, figs. 4*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, Tex.

—— **vesicularis** var. Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 45. Nash., 1840. G. Troost.
Formation: Cretaceous.
Location: Near Purdy, McNairy county, Tenn.

—— **vesicularis** var. Troost. (1840.)
Fifth Geol. Rep. Tenn., p. 45. Nash., 1840. G. Troost.
Formation: Cretaceous.
Location: Near Purdy, McNairy county, Tenn.

Ostrea—Continued.

—— **villicata** (Con.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 65, pl. 36, figs. 20, 21. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Rio Grande, between El Paso and Frontera, Tex.

—— **vomer** (d'Orb.) Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, p. 39, pl. 16, figs. 13–15. Marseilles, 1869. H. Coquand.

Formation: Cretaceous [?].

Location: New Jersey.

—— **vomer** (Mort.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 302, pl. 48, figs. 8–10. Wash., 1884. C. A. White.

Formation: Cretaceous.

—— **washingtoni** n. s. Coquand. (1869.)

Monog. Genre Ostrea Terrain Crétacé, pp. 63, 64, pl. 33, figs. 5–9. Marseilles, 1869. H. Coquand.

Formation: Cretaceous.

Location: Texas flat, Folsom, Cottonwood creek, Shasta county, Cal.

—— **wyomingensis** n. s. Meek. (1872.)

Fifth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 375. Wash., 1872. F. B. Meek.

Formation: Cretaceous.

Location: Point of Rocks, Wyo.

—— **wyomingensis** Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 508, 509. Wash., 1873. F. B. Meek.

Formation: Cretaceous.

Location: Point of Rocks, Wyo.

—— (**Alectryonia**) **blackii** n. s. White. (1879.)

Proc. U. S. Nat. Mus., vol. 2, pt. 2, p. 293, pl. 4, figs. 1, 2. Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.

Formation: Cretaceous.

Location: Collin county, Tex.

—— (**Alectryonia**) **blackii** White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 11, 12, pl. 14, figs. 1*a*, *b*, pl. 17, fig. 4*a*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Collin county, Tex.

—— (**Alectryonia**) **dilleri** n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, pp. 14, 15, pl. 1, figs. 1, 2; pl. 2, figs. 1, 2. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Half a mile south of the falls of Clover creek, Shasta county, Cal.

—— (**Alectryonia**) **larva** (Lam.) White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p, 296, pl. 42, figs. 2–9. Wash., 1884. C. A. White.

Formation: Cretaceous.

Ostrea—Continued.

—— (**Alectryonia**) **procumbens** White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 290, pl. 35, figs. 6–8. Wash., 1884. C. A. White.

Formation: Jurassic.

Location: Northwestern Colorado.

—— (**Alectryonia**) **sannionis** n. s. White. (1876.)

Rep. Geol. Uinta Mts., p. 112. Wash., 1876. C. A. White.

Formation: Cretaceous.

Location: Weber valley, near Coalville, Utah.

—— (**Alectryonia**) **sannionis** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

—— (**Alectryonia**) **sannionis** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 277, 278, pl. 2, figs. 2*a*–*e*. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Valley of Weber river, near Coalville, Utah.

—— (**Alectryonia**) **sannionis** White. (1884.)

Fourth Ann. Rep. U. S. Geol. Sur., p. 300, pl. 45, figs. 3–7. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

—— (**Gryphæa?**) **uniformis** n. s. Meek. (1876.)

Rep. Expl. Exped. Sante Fe, N. Mex., to junction of Grand and Green rivers, p. 124, pl. 1, figs. 2*a*–*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Pagosa, N. Mex.

—— (**Gryphæostrea ?**) **subalata** n. s. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 15, 16, pl. 25, figs. 5. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river.

—— **sp. undet.** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, p. 245. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: Near Arneytown, N. J.

—— **sp. undet.** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 284. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: Mullica hill, N. J.

—— **sp. undet.** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 284. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: [New Jersey ?]

trea—Continued.

— sp. undet. Roemer. (1849.)
Texas, p. 394. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and Waco camp near New Braunfels, Tex.

— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 76. Bonn, 1852 F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 76. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp on the Guadalupe above New Braunfels, Tex.

— sp. undet. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 275. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

— sp. undet. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 430. Phila., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Near Coalville [Utah].

— sp. undet. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 12, 13, pl. 2, figs. 8*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kans.

— sp. undet. Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, p. 83. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

— sp. undet. Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 140, 141, pl. 15, figs. 10*a*–*c*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

— sp. undet. Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 175. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Entrance to Departure bay, Vancouver island.

— —— sp. ? H. & W. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 2, pp. 285, 286, pl. 7, fig. 12. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Northwest of Rawlings station, Wyo.

— —— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

Ostrea—Continued.

—— —— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— —— ? White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 39. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Waldron island.

Ovulina clava Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 2*b*. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Oxystele (Phillippi) White. (1885.)
Bull. U. S. Geol. Sur., No. 22, p. 12. Wash., 1885. C. A. White.

Oxytoma mucronata (Meek) Whiteaves. 1884.)
Geol. and Nat. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 238, 239, pl. 31, fig. 9. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East side of Alliford bay; south side of Maud island.

—— mucronata (M. & H.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 251, pl. 33, figs. 6, 6*a*, *b*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

—— n. subgen. Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 39. Wash., 1864. F. B. Meek.

Pachycardium n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 96. Phila., 1870. T. A. Conrad.

—— (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 172. Wash. 1876. F. B. Meek.

—— burlingtonense n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 138, pl. 21, figs. 6, 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near Burlington, ? N. J.

—— spillmani n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 96. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Mississippi.

Pachymya [Sow.] Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 604. St. Louis, 1856–1860. B. F. Shumard.

Pachymya—Continued.

—— **austinensis** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 604, 605. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Shoal creek, near Austin, Tex.

—— **austinensis** (Shum.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 298, pl. 8, figs. 1*a*, *b*; pl. 5, figs. 7*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Shoal creek, near Austin [Tex.]. Salado, Bell county, Tex.

—— ? **compacta** n. s. White. (1879.)
Proc. U. S. Nat. Mus., vol. 2, pt. 2, p. 297, pl. 6, figs. 3, 4. Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Bell county, Tex.

—— **compacta** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 22, 23, pl. 17, figs. 4*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Bell county, Tex.

—— ? **herseyi** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of Saint Vrains creek, and in the valley of the Cache à la Poudre; also in the valley of Bear creek, near Morrison, Colo.

—— ? **herseyi** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— ? **herseyi** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 298, 299, pl. 5, figs. 5*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near the confluence of the Saint Vrains with the South Platte, northern Colorado.

—— ? **truncata** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 301, 302. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Vicinity of Salt Lake.

Pachyodon (subgen. Gabb) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 241. Wash., 1876. F. B. Meek.

Pachythærus n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, p. 47. Phila., 1870. T. A. Conrad.

—— subgen. Conrad. (1872.)
Proc. Acad. Nat. Sci., Phila., for 1872, p. 50 Phila., 1872. T. A. Conrad.

Palaæstacus (?) **ornatus** Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 183, 184, pl. 25, fig. 3 Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sounding creek, Township 30, Range 5, west of the fourth principal meridian, Northwest Territory.

Palæatractus n. g. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 148, 14 Phila., 1869. W. M. Gabb.

—— **crassus** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, p. 148, pl. 26, fig. 26. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Canyon in the foothills, a mile south of the road from Colusa to the Sulphur springs, near the eastern margin of the Coast Range, Colusa county, Cal.

Palæmcera (subgen. Stoliczka) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

Paliurus n. g. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 324. Phila., 1876. W. M. Gabb.

—— **pentangulatus** n. s. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 302, 303, pl. 4, figs. 4*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Monument creek, near Colorado springs [Colo.].

—— **triangularis** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 324. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Vincentown, N. J.

Palmula n. g. Lea. (1833.)
Cont. Geol., p. 219. Phila., 1833. Isaac Lea.

—— **sagittaria** n. s. Lea. (1833.)
Cont. Geol., pp. 219, 220, pl. 6, fig. 228. Phila., 1833. Isaac Lea.
Formation: Cretaceous.
Location: Timber creek, N. J.

Paludina conradi n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 122. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Bad lands of the Judith.

—— **leidyi** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 123. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Ten miles below Fort Union.

—— **leai** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 121, 122. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Union.

ludina—Continued.

— multilineata n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 120, 121. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Clark.

— peculiaris n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 122. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Fort Clark.

— retusa n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 122. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union.

— trochiformis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 122, 123. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Ten miles below Fort Union.

— vetula n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 121. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Bad lands of the Judith.

nopæa [Ménard] Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275. Phila., 1850–1854. T. A. Conrad.

— ædilis n. s. Eichwald. (1871.)
Geog. Paleont. Bermerk. Halb. Mang. aleutischen Inseln, pp. 162, 163, Taf. 12, figs. 14, 15. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

— alata n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 164, Taf. 13, figs. 3, 4. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

— aleutica n. s. Eichwald. (1871.)
Geog. Paleont, Bemerk. Halb. Mang. aleutischen Inseln, p. 159, Taf. 12. figs. 7, 8. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

— concentrica n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont, vol. 1, p. 148, pl. 22, fig. 119. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek and Martinez, Cal.

— curta n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 12, 13, pl. 2, fig. 3. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Forks of Devil's Pine and Three hills creeks, Canada.

Panopæa—Continued.

—— decisa n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275, pl. 24, fig. 19. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Burlington county, N. J.; Chesapeake and Delaware canal.

Panopæa decisa (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 181, 182, pl. 24, figs. 5–8. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holland, Monmouth county and near Burlington and elsewhere in New Jersey.

Panopæa dilatata n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 159, 160, Taf. 12, figs. 9, 11. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

Panopea elliptica n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 219, 220, pl. 28, figs. 24, 25. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near New Egypt, N. J.

Panopæa inflata n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 158, Taf. 12, figs. 5–6. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— occidentalis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 270, 271. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Near mouth of Judith river, Nebr.

—— newberryi n. s. Shumard. (1859.)
Trans. Acad. Sci. St. Louis, vol. 1, 1856–1860, p. 605. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Parker county and Comanche peak, Johnson county, Tex.

—— protracta n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 160, 161, Taf. 13, figs. 8–9. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— retracta n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 161, 162, Taf. 13, figs. 5–7. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— rustica n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 164, Taf. 12, figs. 12, 13. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

Panopæa—Continued.

—— **simulatrix** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 11, 12, pl. 2, fig. 2, 2a Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South bank of Knee hills creek, in township 29, range 22, west of the fourth meridian; Rye Grass flat on the Old Man river; mouth of East Arrowwood creek, on the Bow river; Belly river, twenty-three miles above the mouth of the Waterton, Canada.

—— **subovalis** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 44, 45, pl. 6, figs. 6, 6a. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Four miles south of Battle river, township 38, between ranges 12 and 13, west of fourth meridian, Canada.

—— **subparallela** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 605, 606. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Fannin county, Tex.

—— **subplicata** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861–1862, pp. 199, 200. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield Point, Navarro county, Tex.

—— **texana** Shumard. (1853.)
Expl. Red River, La., by R. B. Marcy, p. 207, pl. 6, fig. 1. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Camp No. 4, Cross Timbers, Tex.

—— (**Myacites**) **subelliptica** n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, pp. 52, 53. Phila., 1859. Meek & Hayden.
Formation: Jurassic.
Location: Western and southwestern base Black hills.

—— ? sp. undet. Roemer. (1849.)
Texas, p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Upper course of Pedernales river, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 45. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of Pedernales river, Tex.

Paramelania (Smith) White. (1882.)
Proc. U. S. Nat. Mus., vol. 5, p. 98. Wash., 1883. C. A. White.

Paramithrax (Milne-Edwards) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 37. Wash., 1883. C. A. White.

Paramithrax—Continued.

—— ? **walkeri** (Whitfield) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 37, 38, pl. 16, fig. 1a; pl. 17, fig. 1a. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near San Antonio, Tex.

—— n. g. Conrad. (1867.)
Am. Jour. Conch., vol. 3, p. 8. Phila., 1867. T. A. Conrad.

Paranomia n. subgen. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 290. Phila., 1858–1860. T. A. Conrad.

—— **lineata** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 45. pl. 9, fig. 1 Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Upper Freehold, N. J.

—— **saffordi** (Conrad sp.) Conrad. (1867.)
Am. Jour. Conch., vol. 3, p. 8. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.

—— **saffordi** (Con.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 35 Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— **scabra** (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 44, pl. 10, fig. 10. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

Parapholas (Conrad) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 300. Wash., 1879. C. A. White.

—— **sphenoideus** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 300–302, pl. 5, figs. 1a–d. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, southern Utah.

Parasmilia austinensis n. s. Roemer. (1888.)
Paleont., Abhandl. Vierter Band., Heft. 4, p. 6, Taf. 1 [xxxi], figs. 1a, 1b. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Barton creek, near Austin, Tex.

—— **balanophylloides** n. s. Bölsche. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 215, 216. Berlin, 1870. Wilh. Bölsche.
Formation: Cretaceous.
Location: Woodbury, N. J.

tella (Lam.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 50. Phila., 1834. S. G. Morton.

— tentorium n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 291. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.

— tentorium Morton. (1834.)
Synop. Org Rem. Cret. Gr. U. S., p. 50, pl. 1, fig. 11. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Near Arneytown, N. J.

— traskii n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 140, pl. 21, fig. 103. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 244. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

toceras n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 485. Wash., 1876. F. B. Meek.

tula subgen. (Haldeman) White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, p. 160. Wash., 1880. Smithson. Misc. Coll., vol. 22. Wash., 1880. C. A. White.

— angulifera n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 18, pl. 2, figs. 6, 6*a*, *b*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Pincher creek, Canada.

— obtusata n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 18, 19, pl. 2, figs. 7, 7*a*, *b*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Old Man river, twelve miles below Fort McLeod, and two miles above Rye Grass flat; Belly river, seven miles above the mouth of the Old Man river, Canada.

pyridea (Swains.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 326. Phila., 1855–1858. T. A. Conrad.

— bella n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 326. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

cten (Linn.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.

— acutiplicatus n. s. Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 46, pl. 8, fig. 3. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

Pecten—Continued.

—— æquicostatus (Lam.) Roemer. (1819.)
Texas, pp. 398, 399. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Upper Brazos river and crossing of the Cibolo between New Braunfels and San Antonio, Tex.

—— anatipes n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 293, pl. 5, fig. 4. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Claiborne, Ala.

—— anatipes Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 58, pl. 5, fig. 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Claiborne, Ala.

—— argillensis n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser. 1858–1860, p. 283. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Ala. [Miss.].

—— asper (Lam.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 328. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Tennessee. ?

—— bellistriata n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 311. Phila., 1861. F. B. Meek.
Formation: Jurassic.
Location: Red buttes on the North Platte (lat. 42° 50′, long. 106° 40′ W.).

—— burlingtonensis n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 304, pl. 48, fig. 26. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— californicus n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 201, 202, pl. 31, fig. 270. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

—— calvatus n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 58, 59, pl. 10, fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Near the Eutaw springs, S. C.

—— calvatus n. s. Morton.
Am. Jour. Sci., 1st ser., vol. 24, p. 130, pl. 10, fig. 3. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina.

—— carlottensis n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can.; Mes. Foss., vol. 1, pt. 3, p. 251, pl. 33, fig. 7. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

Pecten—Continued.

—— **complexicosta** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 199, pl. 33, figs. 97, 97*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Morgan valley, south of Clear lake, Cal.

—— **craticula** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 293. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **craticula** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 57, 58. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Near Arneytown, New Jersey.

—— **deformis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 33, 34, pl. 6, fig. 34. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Gifford's ranch, Plumas county, Cal.

—— **duplicosta** n. s. Roemer. (1849.)
Texas, p. 398. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Upper course of Pedernales river, Tex.

—— **duplicosta**. Roemer. (1852.)
Kreide von Tex., pp. 65, 66, Taf. 8, figs. 2*a*–*b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: On the upper course of Pedernales river, Tex.

—— **extenuatus** n. s. (M. & H.) (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 184. Phila., 1861. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills, Nebr.

—— **interradiatus** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 199, 200, pl. 33, figs. 98, 98*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: East of New Idria, Cal.

—— **martinezensis** n. s. Gabb. (1869.)
Geol. Sur. Cal., Paleont., vol. 2, pp. 198, 199, pl. 33, fig. 96. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **membranosus** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24, p. 130, pl. 10, fig. 4. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina.

—— **membranosus** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 59, pl. 10, fig. 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina.

—— **mississippiensis** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 283. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

Pecten—Continued.

—— **nebrascensis** n. s. (M. & H.) (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 57. Phila., 1857, Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from its mouth, Nebr.

—— **newberryi** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur., Rocky Mt. Region: Prelim. Rept. Paleont. Black hills, pp. 16, 17. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: T—— Spring, west of the Black hills of Dakota.

—— **newberryi** Whitfield. (1880.)
Rep. Geol. Black Hills of Dakota, pp. 350, 351, pl. 4, figs. 12–15. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: T—— Springs, west of the Black hills of Dakota.

—— **nilssoni** (Goldfuss) Roemer. (1852.)
Kreide von Tex., p. 67, Taf. 8, fig. 6. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ravine three miles from New Braunfels, on road to Seguin, Tex.

—— **nilssonii** (Roem.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 365. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.

—— **operculiformis** n. s. Gabb. (1864.)
Geol. Sur. Cal., Paleont., vol. 1, p. 201, pl. 26, fig. 188. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood and Huling creeks, Shasta county; Curry's, south of Mount Diablo, Cal.

—— **? perisphinctes payeri** n. s. Toula. (1874.)
Die Zweite Deutsche Nordpolarfahrt Zweiter Band, pp. 498, 499, Taf. 1, figs. 1*a*–*c*. Leipzig, 1874. Franz Toula.
Formation: Jurassic [Cretaceous?].
Location: Kuhn island, east coast of Greenland.

—— **perplanus** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 293, pl. 5, fig. 5. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Claiborne, Ala.

—— **perplanus** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 58, pl. 5, fig. 5; pl. 15, fig. 8. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Claiborne, Ala.

—— **planicostatus** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 48, 49, pl. 8, figs. 10, 11. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: G. C. Schanck's pits, near Marlboro, N. J.

—— **poulsoni** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 59, pl. 19, fig. 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Near Claiborne, Ala.

Pecten—Continued.

—— **quadricostatus** (Sow.) Roemer. (1849.)
Texas, p. 398. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Fredericksburg, and Waco camp, Tex.

—— **quadricostatus** (Sow.) Roemer. (1852.)
Kreide von Tex., p. 64. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, New Braunfels, Tex.

—— **quadricostatus** (Sow.) Shumard. (1853.)
Expl. Red river, La., by R. B. Marcy, p. 204, pl. 3; fig. 6; pl. 2, figs. 2*a*, *b*. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Fort Washita, Ind. Ter.

—— **quadricostatus** (Sow.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 232. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Middletown, N. J.

—— **quadricostatus** var. Roemer. (1852.)
Kreide von Tex., p. 64, Taf. 8, figs. 4*a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **quinquecostatus** (Sow.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 5. New Haven, 1830. S. G. Morton.

—— **quinquecostatus** (Sow.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: United States.

—— **quinquecostatus** (Sow.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 57, pl. 19, fig. 1. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **quinquecostatus** (Sow.) Bronn. (1838.)
Lethaea Geognostica, Zweiter Band, pp. 678–680, Taf. 30, fig. 17. Stuttgart, 1838. H. G. Bronn.
Formation: Cretaceous.
Location: New Jersey.

—— **quinquenaria** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275, pl. 24, fig. 10. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Chesapeake and Delaware canal.

Pecten—Continued.

—— **quinquenarius** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 47, pl. 7, figs. 13–16. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: G. C. Schanck's pits, Marlboro, N. J.

—— **rhodani** (Pict. & Camp.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 136–137. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **rigida** n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci.; n. ser., vol. 5, p. 381, pl. 2, figs. 4*a–c*. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Sage creek, Nebr.

—— **simplicius** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 283, 284, pl. 46, fig. 44. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **tenuitesta** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 327, 328. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington and adjoining counties, N. J.

—— **tenuitestus** (Gabb) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 47, 48, pl. 7, figs. 5, 6. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, G. C. Schanck's pits, near Marlboro and Burlington, N. J.

—— **texanus** n. s. Roemer. (1852.)
Kreide von Tex., p. 65, Taf. 8, figs. 3*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: River drift at crossing of Cibolo between New Braunfels and San Antonio, Tex.

—— **texanus** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 365. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey and Alabama.

—— **traskii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont, vol. 1, pp. 200, 201, pl. 26, figs. 186, 187, *a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **traskii** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 198, pl. 32, fig. 95. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal., north shore of Departure bay, near Nanaimo, Vancouver island.

Pecten—Continued.

—— venustus n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 293, pl. 5, fig. 7. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— venustus Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 58, pl. 5, fig. 7. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Near Arneytown, N. J.

—— venustus (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 45, 46, pl. 8, figs. 1-4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Monmouth, Freehold, Burlington, Arneytown, etc., N. J.

—— virgatus (Nilsson) Roemer. (1849.)
Texas, p. 399. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall, near New Braunfels, and Fredericksburg, Tex.

—— virgatus (Nilsson) Roemer. (1852.)
Kreide von Tex., pp. 66, 67, Taf. 8, figs. 5a, b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ravine, three miles from New Braunfels, on road to Seguin, Waterfall of the Guadalupe and Fredericksburg, Tex.

—— (Chlamys) craticulus (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 49, 50, pl. 7, figs. 17, 18. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Arneytown and Vincentown [?], N. J.

—— (Syncyclonema?) perlamellosus (Con.?) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 50, 51, pl. 7, fig. 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 245. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 245. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

—— sp. undet. Roemer. (1849.)
Texas, p. 399. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ravine, on the Guadalupe, three miles below New Braunfels, Tex.

—— sp. undet. Roemer. (1849.)
Texas, p. 399. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, near New Braunfels, Tex.

Pecten—Continued.

—— [sp. undet.] Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 16. Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Volcano, about thirty miles southeast of Walker's lake, Nev.

—— sp. undet. Urquiza. (1882.)
An. Min. Fomento Rep. Mex., Tomo 7, p. 25, figs. 17, 18. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Canada de la Guayabilla, Coalcoman district, state of Michoacan, Mexico.

Pectunculina parvula n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 85. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, Nebr.

Pectunculus [Lam.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 64. Phila., 1834. S. G. Morton.

—— (subgen. Adan.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 166. Wash., 1876. F. B Meek.

—— australis n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 64. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— globulus n. s. Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 124, 125, Taf. 15, figs. 9, 10. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

—— hamula n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 64, pl. 15, fig. 7. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

—— siouxensis n. s. H. & M. (1854.)
Mem. Am. Acad. Arts and Sci., vol. 5, n. s. p. 384, pl. 1, fig. 12. Cambridge and Boston, 1855. Hall & Meek.
Formation: Cretaceous.
Location: Mouth of Big Sioux, on the Missouri river.

—— subimbricatus n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 146. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Heart river, Nebr.

—— (Cardium) aleuticus (Gir.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen, Inseln., pp. 125, 126. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula and Kadiak, Unga, and Atcha islands.

Pectunculus—Continued.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 64. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Pentacrinites (Mille.) Meek. (1860.)
Rep. Expl. Great Basin Terr. Utah, p. 355. Wash., 1876. F. B. Meek.

—— **asteriscus** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 67, pl. 3, figs. 2, *a*, *b*, and wood cut. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills, and opposite Red buttes, North Platte river.

—— **asteriscus?** (M. & H.) H. & W. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 2, pp. 280, 281, pl. 6, fig. 16. Wash., 1877. Hall & Whitfield.
Formation: Triassic.
Location: Near Dun Glen pass, Pah-Ute range, Nev.

—— **asteriscus** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dakota, p. 345, pl. 3, figs. 1, 2. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Big Horn mountains.

—— **(sp. undet.)** Meek. (1860.)
Rep. Expl. Great Basin Terr. Utah, p. 355. Wash., 1876. F. B. Meek.
Formation: Jurassic.
Location: Near Red buttes, on the North Platte.

Pentacrinus asteriscus n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, pp. 49, 50. Phila., 1859. Meek & Hayden.
Formation: Jurassic.
Location: South and southwest base of Black hills; Stone butte.

—— **asteriscus** (M. & H.) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur., west of one-hundreth meridian, vol. 4, pt. 1, pp. 162, 163, pl. 13, figs. 6*a*, *b*. Wash., 1875. C. A. White.
Formation: Jurassic.
Location: Salt creek near Nephi, and Diamond valley near St. George, Utah; also in Utah.

—— **bryani** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 178, pl. 5, figs. 1, 1*a*, *b*. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Neighborhood of Vincentown, N. J.

Periaster (d'Orb.) Desor. (1858.)
Synop. Echinoides Foss., p. 382. Paris and Wiesbade, 1858. E. Desor.

Periaster—Continued.

—— **texanus** (Roemer sp.) Desor. (1858.)
Synop. Echinoides Foss., pp. 384, 385. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

Periploma (Schum.) Con. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d. ser., 1855–1858, p. 324. Phila., 1855–1858. T. A. Conrad.

—— **applicata** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d. ser., 1855–1858, p. 324. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **applicata** Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 276, pl. 46, fig. 3. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **cuspidatum** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 220, 221, pl. 29, figs. 4, 4*a*, *b*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North side of Maud island.

—— **suborbiculatum** n. s. Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 138, 139, pl. 17, fig. 6. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two miles and a quarter up.

—— **sp. undet.** Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 76, pl. 3, fig. 10. Phila., 1871. T. A. Conrad.

Periplomya (Con.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 305. Phila., 1876. W. M. Gabb.

—— **elliptica** (Gabb.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 177, 178, pl. 23, figs. 14–15. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Mullica hill and Holmdel, N. J.

—— **elliptica** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 305. Phila., 1376. W. M. Gabb.
Formation: Cretaceous.

—— **truncata** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 220, 221, pl. 28, figs. 20, 21. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near New Egypt, N. J.

Perisphinctes anceps? (Reinecke sp.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 407. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

Perisphinctes—Continued.

—— anceps ? (Reinecke sp.) Whiteaves. (1878.)
Geol. Sur., Can.; Rep. Prog., for 1876, 1877, p. 157. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— operculiformis (Gabb) Eichwald. (1871.)
Geol. Paleont., Bemerk. Halb. Mang. aleutischen Inseln, p. 199, Taf. 19, figs. 5, 6. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: North shore of Katschemak bay, Alaska.

—— skidegatensis Whiteaves. (1884.)
Geol. and Nat. Hist. Sur., Can.; Mes. Foss., vol. 1, pt. 3, p. 210. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island.

Perna (Brug.) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 37. Wash., 1889. C. A. White.

—— excavata n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 37, pl. 7, fig. 1. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia island, Sheep Jack island and Waldron island.

Pernites sp. undet. Ramirez. (1880.)
An. Min. Fomento Rep. Mex., Tomo. 3, p. 657, Lam. 1, fig. 5. Mexico, 1880. S. Ramirez.
Formation: Cretaceous.
Location: Sierra Mojado, Mexico.

Peronæa (subgen. Poli) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr. vol. 9, p. 194. Wash., 1876. F. B. Meek.

Peronæoderma (Poli) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 308. Phila., 1876. W. M. Gabb.

—— (subgen. Poli) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

—— georgiana n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 308. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Perrisonota n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 98. Phila., 1870. T. A. Conrad.

—— protexta n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 98, pl. 9, fig. 24. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— protexta (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 110, pl. 11, figs. 14, 15. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Perissolax n. g. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 91. Phila., 1864. W. M. Gabb.

—— blakei (Con.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 92. pl. 21, fig. 110. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; near the coal mines at Clayton, Cochran's east of Mount Diablo, and near the Cañada de las Uvas, Los Angeles county, Cal.

—— blakei (Con. sp.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 149, 150. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— brevirostris n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 91, pl. 19, fig. 43. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Martinez, Pence's ranch etc., Cal.

—— brevirostris (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 121. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— brevirostris (Gabb) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 46. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sheep Jack islands.

Petricola (Lam.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 216. Wash., 1885. R. P. Whitfield.

—— nova-ægyptica n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 216, 217, pl. 28, fig. 22. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near New Egypt, N. J.

Phanerostomum asperum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 24. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— asperum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 42. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— dilatatum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 16, 30. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— globulosum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 44. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Phanerostomum—Continued.

—— hexacyclus Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 31. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— hexaleptum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 22. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— hispidulum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 22, 29. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— lacerum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 17, 18. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— læve Ehrenburg. (1854.)
Mikrogeologie, Taf. 32, fig. 19. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— porulosum Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 15. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— senarium Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 25. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— quarternarium Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 20. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— quarternarium Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 46. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Pharella (Gray) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 147. Phila., 1864. W. M. Grabb.

—— alta n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol., 1, p. 147, pl. 22, fig. 118. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Hills west of Martinez, Cal.

—— ? dakotaensis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 251, 252, pl. 1, fig. 3. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Vermilion river, Nebr.

Pharella—Continued.

—— ? pealei n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 496. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Missouri river, below Gallatin, Mont.

—— ? pealei (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 21, 22, pl. 11, figs. 6a, b. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Missouri river, below Gallatin, Mont.

Phasianella [Lam.] Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 597. St. Louis, 1856–1860. B. F. Shumard.

—— ervina (d'Orb.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 118. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

—— perovata n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 597. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Comanche peak, and in Parker county, near Brazos river, Tex.

—— punctata n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 299, pl. 48, fig. 3. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, N. J.

—— sp. undet. Roemer. (1849.)
Texas, p. 414. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— ? sp. undet. Roemer. (1852.)
Kreide von Tex., p. 38. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

Pholadomya [Sow.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 68. Phila., 1834. S. G. Morton.

—— (Sow. typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 214. Wash., 1876. F. B. Meek.

—— anteradiata n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 276, pl. 46, fig. 3. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— borealis n. s. Meek. (1858.)
Trans. Albany Inst., vol. 4, pp. 40, 41. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

Pholadomya—Continued.

—— **brewerii n. s. Gabb. (1864.)**

Geol. Sur. Cal. Paleont., vol. 1, p. 152, pl. 22, fig. 123. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Pence's ranch, Butte county, Cal.

—— **humilis n. s. M. & H. (1860.)**

Proc. Acad. Nat. Sci., Phila., for 1860, p. 182. Phila., 1861. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills, Nebr.

—— **humilis M. & H. (1865.)**

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14. No. 172, p. 104, pl. 4, figs. 3, *a*, *b*. Wash., 1865. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— **kingii (Meek) White. (1883.)**

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 150, 151, pl. 38, figs. 3*a*, *b*. Wash., 1883. C. A. White.

Formation: Jurassic.

Location: Near the lower canyon of the Yellowstone river, Mont.

—— **linceoumi n. s. Shumard. (1861.)**

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 199. Boston, 1862. B. F. Shumard.

Formation: Cretaceous.

Location: Corsicana, Navarro county, Tex.

—— **littlei n. s. Gabb. (1876.)**

Proc. Acad. Nat. Sci., Phila., for 1876, pp. 305, 306. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Pataula creek, Clay county, Ga.

—— **multilineata n. s. Gabb. (1869.)**

Am. Jour. Conch. vol. 5, Phila., 1869, 1870, p. 10, pl. 5, fig. 6. Phila., 1870. W. M. Gabb.

Formation: Jurassic.

Location: Volcano, about thirty miles southeast of Walker's lake, Nev.

—— **nasuta n. s. Gabb. (1864.)**

Geol. Sur. Cal. Paleont., vol. 1, p. 152, pl. 30, fig. 124. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Shore of the Straits of Carquines, two miles west of Martinez, Cal.

—— **nevadana n. s. Gabb. (1869.)**

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 10, pl. 5, fig. 7 [9]. Phila., 1870. W. M. Gabb.

Formation: Jurassic.

Location: Volcano, about thirty miles southeast of Walker's lake, Nev.

—— **occidentalis n. s. Morton. (1833.)**

Am. Jour. Sci., 1st ser., vol. 23, p. 292, pl. 8, fig. 3. New Haven, 1833. S. G. Morton.

Formation: Cretaceous.

—— **occidentalis Morton. (1834.)**

Synop. Org. Rem. Cret. Gr. U. S., p. 68, pl. 8, fig. 3. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Chesapeake and Delaware canal.

Pholadomya—Continued.

—— **occidentalis (Mort.) Conrad. (1860.)**

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, pp. 276, 277. Phila., 1858-1860. T. A. Conrad.

Formation: Cretaceous.

Location: Tippah county, Miss.

—— **occidentalis (Mort.) Owen. (1860.)**

Second Rep. Geol. Rec. Ark. pl. 8, fig. 9. Phila., 1860. D. D. Owen.

Formation: Cretaceous.

Location: Arkansas.

—— **occidentalis (Mort.) Whitfield. (1885.)**

Mon. U. S. Geol. Sur., vol. 9, pp. 175, 176, pl. 24, figs. 1-3. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Monmouth, Burlington, and other localities in the lower green marls of New Jersey.

—— **orbiculata n. s. Gabb. (1864).**

Proc. Cal. Acad. Nat. Sci., vol. 3, p. 173. San Francisco, 1863-1868. W. M. Gabb.

Formation: Jurassic [Cretaceous ?].

Location: Mariposa estate, Mariposa county, Cal.

—— **[?] orbiculata (Gabb) Meek (1865.)**

Geol. Sur. Cal. Geol., vol. 1, p. 481, pl. 1, fig. 4. Phila., 1865. F. B Meek.

Formation: Jurassic [Cretaceous ?].

Location: Mariposa estate, Cal.

—— **oregonensis n. s. Gabb. (1869.)**

Geol. Sur. Cal. Paleont., vol. 2, p. 178, pl. 29, fig. 65. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Near the toll house at the summit of the Siskiyou mountains, near the southern boundary of Oregon.

—— **ovuloides n. s. Whiteaves. (1876.)**

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 59, 60, pl. 9, fig. 9. Montreal, 1876. J. F. Whiteaves.

Formation: Cretaceous.

Location: Queen Charlotte islands.

—— **panderi n. s. Eichwald. (1871.)**

Geogr. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, pp. 165, 166, Taf. 13, figs. 10, 11. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaska.

—— **papyracea n. s. M. & H. (1862.)**

Proc. Acad. Nat. Sci., Phila., for 1862, p 23. Phila., 1863. Meek & Hayden.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Missouri river.

—— **papyracea (M. & H.) Meek. (1876.)**

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 217, pl. 5, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Chippewa point on the upper Missouri.

Pholadomya—Continued.

—— **papyracea** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 85. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest branch of North fork of the Old Man river about four miles below the mouth of Oyster creek, Canada.

—— **papyria** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 276. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— **pedernalis** n. s. Roemer. (1852.)

Kreide von Tex., pp. 45, 46, Taf. 6, figs. 4, *a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **postsulcata** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 276. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— **roemeri** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 176, 177, pl. 24, fig. 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Rev. G. C. Schanck's pits, near Marlboro, Monmouth county, N. J.

—— **royana** (d'Orb.) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss, vol. 1, pt. 2, pp. 140, 141. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island; Sucia islands.

—— **sancti-sabæ** (Roemer.) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 164, pl. 21, fig. 4. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: New Braunfels, Tex.

—— **scaphæformis** n. s. Eichwald. (1871.)

Geogr. Paleont. Bemerk. Halb. Mang., aleutischen Inseln, pp. 164, 165, Taf. 13, figs. 1, 2. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **sonorensis** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 265, pl. 36, fig. 12. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Mexico.

—— **subelongata** n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, p. 42. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

Pholadomya—Continued.

—— **subelongata** Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, p. 362, pl. 2, figs. 1, 1*a*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island, also on New Castle island.

—— **subelongata** (Meek). White. (1889.)

Bull. U. S. Geol. Sur., No. 51, pp. 42, 43. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Waldron island.

—— **subventricosa** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 142. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **subventricosa** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 217, 218, pl. 39, figs. 8, *a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Idaho Ter.

—— **subventricosa** (M. & H.) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 178. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: North Saskatchewan river, at Fort Pitt, and in township 54, range 2, west of the fourth principal meridian, Northwest Territory.

—— **texana** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 152, pl. 19, fig. 3. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Turkey creek, Leon and Eagle pass roads.

—— **tippana** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, pl. 34, fig. 9, p. 324. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **undata** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 81. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **vancouverensis** n. s. Whiteaves. (1882.)

Proc. and Trans. Roy. Soc., Can., vol. 1, sec. 4, p. 83, fig. 2. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northeast slope of Jackass mountain, in the valley of the Lower Fraser, Canada.

—— (**Protocardia**) **hodgii** Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 219, pl. 13, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the great bend of the Missouri, below Fort Pierre.

Pholadomya—Continued.

—— sp. undet. Roemer. (1849.)
Texas, p. 408. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 428. Phila., 1871. F. B. Meek.
Formation: Jurassic.
Location: Salinas creek, Hot springs.

—— Fischer. (1872.)
Comptes Rend., 1872, vol. 65, p. 1785. Paris, 1872. P. Fischer.
Formation: Jurassic? [Cretaceous?].
Location: Alaska.

—— sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 263, Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-fourth and two and one-half miles up.

—— sp. undet. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 265 Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— Fischer. (1875.)
Voyages a la Cote Nord-Quest de l'Amerique, p. 34, pl. A, figs. 3, 3*a*, par Alph. L. Pinart. Paris, 1875. P. Fischer.
Formation: Jurassic [Cretaceous?].
Location: Alaska.

—— ? White. (1878.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur., Terr., p. 184. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of Saint Vrains creek, Colo.

Pholas (Linn.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr., U. S., p. 68. Phila., 1834. S. G. Morton.

—— cithara n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr., U. S., p. 98, pl. 9, fig. 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Monmouth county, N. J.

—— cithara (Mort.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 187, 188, pl. 25, figs. 14-16. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Mr. G. C. Schanck's marl pits, near Marlboro, N. J.

—— cretacea n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 393, pl. 68, fig. 18. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Rairitan bay, N. J.

—— cretacea Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 324. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

Pholas—Continued.

—— cuneata n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, p. 53. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Long lake.

—— (?) lata n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 189, 190, pl. 25, fig. 17. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Marlboro, N. J.

—— pectorosa n. s. Conrad. (1852.)
Proc. Acad. Nat. Sci., Phila., vol. 6, 1852, 1853, p. 200. Phila., 1854. T. A. Conrad.
Formation: Cretaceous.
Location: Tinton Falls, Monmouth county, N. J.

—— pectorosa Conrad. (1854.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser. 1850-1854, p. 299, pl. 27, fig. 9. Phila., 1850-1854, T. A. Conrad.
Formation: Cretaceous.
Location: Tinton Falls, Monmouth county, N. J.

—— sp. undet. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 292. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: Monmouth county, N. J.

Phylloceras (Suess) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 458. Wash., 1876. F. B. Meek.

—— ? halli (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 458-462, pl. 24, figs. 3a-c, fig. 64, p. 458. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: One hundred and fifty miles above the mouth of Milk river, on the Missouri, in Mont.

—— ? ramosus Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 371-373, pl. 5, figs. 1, 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, Vancouver island; also in the lower division of the California Cretaceous, at Cottonwood creek, Shasta county, Cal.

Phylloda (subgen. Schumacher) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

Phylloteuthis n. g. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 176. Phila., 1861. Meek & Hayden.

—— subovatus n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860 p. 176. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— subovata (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 505, 506, pl. 33, fig. 3. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Dak.

Phymosoma (Haime) Desor. (1858.)
Synop. Echinoides Foss., p. 86. Paris and Wiesbade, 1858. E. Desor.

—— **texanum** (Roemer sp.) Desor. (1858.)
Synop. Echinoides Foss., p. 90. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Fredericksburg, and San Saba river, Tex.

Physa (Draparnaud) White. (1876.)
Rep. Geol. Uinta Mts., p. 119. Wash., 1876. C. A. White.

—— **atavus** n. s. White. (1877.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. 3, pp. 601, 602. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Dog creek, a tributary of the Upper Missouri river, Mont.

—— **carletoni** n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 508. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, near Coalville, Utah.

—— **carletoni** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **carletoni** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 306, 309, pl. 7, fig. 12*a*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, near Coalville, Utah.

—— **carletoni** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 43, pl. 5, fig. 18. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **copei** n. s. White. (1877.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. 4, p. 602. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: South side of the Missouri river, near Cow island, Mont.

—— **copei** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 85, pl. 24, figs. 4*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Cow island, Upper Missouri river, Mont.

—— **copei** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 44, pl. 25, figs. 1, 2. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Physa—Continued.

—— **copei** (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 14, pl. 2, figs. 4, 4*a*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bow river; eight miles west of Blackfoot crossing; Gooseberry canyon, St. Mary river, and St. Mary river, three miles north of the forty-ninth parallel; Pincher creek, crossing of Mill creek and Fort McLeod trail; High river, one mile below the forks; mouth of Blind Man river, Canada.

—— **copei** (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 63. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, eight miles above the mouth of the Red Deer river; near Bull's head, Canada.

—— **copei** (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Con., Cont. Can. Paleont., vol. 1, pt. 1, p. 71. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, near its junction with the Bow river; south Saskatchewan, six miles below the mouth of the Bow river; South Saskatchewan, one mile below the mouth of the Bow river, Canada.

—— **copei** var. **canadensis** n. var. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 14–16, pl. 2, figs. 5, 5*a*, *b*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Pincher creek, crossing of Mill creek and Fort McLeod trail; Gooseberry canyon, St. Mary river; second or north branch of the Milk river, Canada.

—— **felix** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 714. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Crow creek, Colo., ten miles above its confluence with the Platte.

—— **felix** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 171. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colo.

—— **felix** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 84, 85; pl. 22, fig. 1*a*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colo.

—— **felix** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 44, pl. 25, fig. 3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colo., east of the Rocky mountains.

Physa—Continued.

—— **kanabensis** n. s. White. (1876.)

Rep. Geol. Uinta Mts., p. 119. Wash., 1876. C. A. White.

Formation: Cretaceous.

Location: Upper Kanab, Utah.

—— **longinscula** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 119. Phila., 1857. Meek & Hayden.

Formation: Tertiary [Cretaceous].

Location: Three miles above Fort Union.

—— **nebrascensis** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 119, 120. Phila., 1857. Meek & Hayden.

Formation: Tertiary [Cretaceous].

Location: Three miles below Fort Union.

—— **rhomboidea** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 119. Phila., 1857. Meek & Hayden.

Formation: Tertiary [Cretaceous].

Location: Three miles above Fort Union.

—— **subelongata** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 120. Phila., 1857. Meek & Hayden.

Formation: Tertiary [Cretaceous].

Location; Bad lands of the Judith.

—— ——? White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 237. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

—— ——? White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 307, 308, pl. 7, fig. 13*a*. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Just northeastward from Coalville, Utah.

—— ——? White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 38, pl. 4, fig. 5. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

—— ——? White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 43, pl. 6, fig. 17. Wash., 1883. C. A. White.

Formation: Cretaceous.

Locatton: Southwestern Wyoming.

—— ——? White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., Part 1, p. 85, pl. 30, fig. 11*a*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Piestochilus n. subgen. Meek. (1864.)

Check List Invert., Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 37. Wash., 1864. F. B. Meek.

Pinna [Linn] Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 63. Phila., 1834. S. G. Morton.

Pinna—Continued.

—— **aleutica** n. s. Eichwald. (1871.)

Geogr. Paleont. Bemerk. Halk. Mang. aleutischen Inseln, pp. 183, 184, Taf. 15, figs. 11, 12. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaska.

—— **brewerii** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 188, pl. 25, figs. 175, 175*a*. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Curry's, south of Mount Diablo; Martinez; and Siskiyou mountains, Cal.

—— **brewerii** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 195, pl. 32, fig. 93. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

—— **calamitoides** n. s. Shumard. (1858.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 124. St. Louis, 1856–1860. B. F. Shumard.

Formation: Cretaceous.

Location: Nanaimo river, Vancouver island.

—— **calamitoides** (Shum.) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 167, 168, pl. 20, figs. 1, 1*a*, *b*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Sucia islands.

—— **kingii** n. s. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 131, 132, pl. 12, figs. 9, 9*a*. Wash., 1877. F. B. Meek.

Formation: Jurassic.

Location: Weber canyon, Wasatch range.

—— **lakesi** n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 181. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Fossil ridge, Col.

—— **lakesi** White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 17, 18, pl. 11, figs. 1*a*, *b*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Fossil ridge, about sixteen milest westward from Greeley, and about six miles southward from Fort Collins, Colo.

—— **lakesii** (White) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 84. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: South branch of the south fork of the Old Man river, Canada.

—— **laquata** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 328. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

Pinna—Continued.

—— laqueata (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 81, 82, pl. 16, figs. 1, 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Burlington and Haddonfield, N. J.

—— ? lingula n. s. Newberry. (1861.)
Rep. Colo. River of the West, pt. 3, pp. 119, 120. Wash., 1861. J. S. Newberry.
Formation: Cretaceous.
Location: At Oraybe, one of the Moqui villages.

—— petrina n. s. White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, G. M. Wheeler, pp. 24, 25. Wash., 1874. C. A. White.
Formation: Cretaceous.
Location: East of Mount Taylor, one mile south of Pajuate, N. Mex.

—— petrina White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 182, 183, pl. 13, figs. 7*a*, *b*. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: East of Mount Taylor, one mile south of Pajuate, N. Mex.

—— rostriformis n. s. Morton. (1841.)
Proc. Acad. Nat. Sci., Phila., vol. 1, 1841-1843, p. 132. Phila., 1843. S. G. Morton.
Formation: Cretaceous.
Location: Timber creek, Gloucester county, N. J.

—— rostriformis Morton. (1842.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839-1842, p. 214, pl. 10, fig. 5. Phila., 1839-1842. S. G. Morton.
Formation: Cretaceous.
Location: Timber creek, Gloucester county, N. J.

—— rostriformis (Morton) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 198, pl. 16, figs. 3, 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Timber creek, N. J.

—— stevensoni n. s. White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, pp. 47, 48. Wash., 1880. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous.
Location: One and one-half miles southwestward from Fort Wingate, N. Mex.

—— subcancellata n. s. Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 403. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Falls of the Iltasyouco river.

—— subcancellata Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876, 1877, p. 153. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Falls of the Iltasyouco river, British Columbia.

Pinna—Continued.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: United States.

—— sp. undet. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 63. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey and Alabama.

—— sp. undet. Roemer. (1849.)
Texas, p. 402. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 56. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ravine three miles from New Braunfels, on road to Seguin, Tex.

—— sp. undet. Roemer. (1852.)
Kreide von Tex., p. 56. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— sp. undet. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 268. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de la Conchas, near Arivechi, Sonora, Mex.

—— sp. undet. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 14. Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Mormon station, Plumas county, Cal.

—— —— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— sp. undet. Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 10. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Fort Worth, Tex.

—— sp. undet. Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 10. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Austin, Tex.

Pirenella (subgen. Gray) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 558. Wash., 1876. F. B. Meek.

Pisidium (Pfeiffer) White. (1876.)
Rep. Geol. Uinta Mts., p. 128. Wash., 1876. C. A. White.

Pisidium—Continued.

—— saginatum n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 128. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous].
Location: Almy coal mines, near Evanston, Wyo.

—— saginatum White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyoming, Evanston coal mines.

—— saginatum White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 34, pl. 20, figs. 14, 15. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near Evanston, Wyo.

Pitar (subgen. Roem.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 179. Wash., 1873. F. B. Meek.

Placenticeras Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 462–464. Wash., 1876. F. B. Meek.

—— Meek typical. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 463. Wash., 1876. F. B. Meek.

—— glabrum n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 172–174, pl. 24, figs. 1, 1*a*, *b*. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Peace river, a few miles below Fort Vermilion, Northwest Territory.

—— lenticulare (Owen) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 186. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Fossil ridge, at the mouth of the Saint Vrains, and in the valleys of the Cache à la Poudre, and Little Thompson creek, Colo.

—— occidentale n. s. Whiteaves. (1887.)
Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser., 1886. App. I, p. 113 B. Montreal, 1887. J. F. Whiteaves.
Formation: Cretaceous.
Location: K-uk river, coast of British Columbia.

—— occidentale Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 155, 156, pl. 21, fig. 1. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: K-uk river, coast of British Columbia.

—— perezianum Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 156, 158. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Liard river, below Old Fort Halkett, latitude 59° 26′ N., longitude 124° 48′ W., Canada.

Placenticeras—Continued.

—— (perezianum ? var.) liardense n. var. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 158, pl. 20, figs. 1, 2. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Liard river, near Old Fort Halkett, Canada.

—— placenta (DeKay sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 465–468, pl. 24, figs. 2*a*, *b*, fig. 65, p. 466. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Cheyenne river, Dak., Bear creek, a small tributary of Cheyenne river; North Red river, Minn.

—— placenta var. White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— placenta (DeKay sp.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 53, 54. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Branch of the Saskatchewan, White Mud river (or Frenchman's creek) on the forty-ninth Parallel; Blood Indian creek, longitude 111° west; St. Mary river, near its mouth; Belly river, west of St. Mary river; St. Mary river, west of MacLeod, Benton trail; lake south of Milk river; South Saskatchewan, opposite Swift Current creek, Red Deer river, above crossing of Lord Lorne trail, Canada.

—— placenta (DeKay sp.) Stanton. (1887.)
Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 185. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— placenta (DeKay sp.) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 183. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Battle river, township 40, range 13, west of the fourth principal meridian; Sounding creek, township 30, range 8, west of the same meridian, Northwest Territory.

—— placenta var. intercalare (M. & H.) Meek. (1876.)
Rep U. S. Geol. Sur. Terr., vol. 9, pp. 468–472, pl. 23, figs. 1*a*–*c*, fig. 66, p. 471. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Cheyenne river, at the mouth of Sage creek, Dak., Tarrant county, Tex.

Placenticeras—Continued.

—— **placenta** var. **intercalare** (Meek) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 54. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: St. Mary river; Berry creek, township 25, range 12, west of the fourth principal meridian, Canada.

—— ? **vancouverense** Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 370, 371, pl. 6, figs. 1, 1a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, Vancouver island.

——(**Sphenodiscus**) **lenticulare** (Owen) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 473, 476, pl. 34, figs. 1a–c, fig. 66, p. 473. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

Placento [i] **ceru** [a] s. n. g. Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869–1870, p. 429. Phila., 1871. F. B. Meek.

Placuna (Lam.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 62. Phila., 1834. S. G. Morton.

—— **scabra** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 62. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

Placunanomia (Brod.) Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 290. Phila., 1858–1860. T. A. Conrad.

—— **lineata** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 291, pl. 46, fig. 20. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tennessee.

—— **saffordi** n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 290, 291, pl. 46, fig. 21. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tennessee.

Placunopsis (Morris & Lycett) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 278. Wash., 1879. C. A. White.

—— **hilliardensis** n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 249. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyo.

Placunopsis—Continued.

—— **hilliardensis** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 278, 279, pl. 7, fig. 14. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Hilliard station, Wyo.

Plagiarca n. subgen. Conrad. (1875.)

Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 4. T. A. Conrad.

Plagioptychus (?) **cordatus** n. s. Roemer. (1888.)

Paleont. Abhandl. Vierter Band, Heft 4, pp. 13, 14, Taf. II, [XXXII], figs. 2a–2e. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Bartons creek, near Austin, Tex.

Plagiostoma [Sowerby] Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 59. Phila., 1834. S. G. Morton.

—— **annulatus** n. s. Trask. (1856.)

Proc. Cal. Acad. Nat. Sci., vol. 1, 1st ed., p. 86, pl. 3, fig. 2. San Francisco, 1854–1857. J. B. Trask.
Formation: Cretaceous.
Location: San Pedro, Cal.

—— **dumosum** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 59, 60, pl. 16, fig. 8, p. 60. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Bluff at St. Stephens, on the Tombeckbe river [Alabama].

—— **gregalis** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, pp. 292, 293, pl. 5, fig. 6. New Haven, 1833. S. G. Morton.
Formation: [Cretaceous].
Location: New Jersey.

—— **gregale** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 60, 61, pl. 5, fig. 6. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **pedroana** n. s. Trask. (1856.)

Proc. Cal. Acad. Nat. Sci., vol. 1, 1st ed., p. 86, pl. 3, fig. 1. San Francisco, 1854–1857. J. B. Trask.
Formation. Cretaceous.
Location: San Pedro, Cal.

—— **pelagica** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 293, pl. 5, fig. 2. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **pelagicum** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 61, pl. 5, fig. 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

Plagiostoma—Continued.

—— truncata n. s. Trask. (1856.)
Proc. Cal. Acad. Nat. Sci., vol. 1, 1st ed., p. 86, pl. 3, fig. 3. San Francisco, 1854–1857. J. B. Trask.
Formation: Cretaceous.
Location: San Pedro, Cal.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 245. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

Planorbella (subgen. Hald.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 536. Wash., 1876. F. B. Meek.

Planorbis (Müller) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 106, 107. Wash., 1865. Meek & Hayden.

—— (Müller typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 535. Wash., 1876. F. B. Meek.

—— amplexus n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, pp. 135, 136. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— convolutus n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 120. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Little Horn river.

—— convolutus (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 536, 537, pl. 42, figs. 12*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Little Horn and Powder rivers, Mont.

—— convolutus (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 83. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— convolutus (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 41, pl. 27, fig. 16. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— convolutus var. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 538, pl. 42, figs. 11*a–e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Little Horn and Powder rivers, Mont.

—— fragilis n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 136. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Fort Berthold, on the Missouri river, Nebr.

Planorbis—Continued.

—— paucivolvis n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 71, pl. 10, fig. 5. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, near its junction with the Bow river; South Saskatchewan, six miles below the mouth of Bow river, Canada.

—— subumbilicatus n. s. (M. & H.) (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 120. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union.

—— tenuivolvis n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 135. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— veternus (M. & H.) (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 107, pl. 4, figs. 1, 1*a*, *b*. Wash., 1865. Meek & Hayden.
Formation: Jurassic? [Jurassic].
Location: Southwest base of the Black hills.

—— veternus (M. & H.) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog., for 1876–1877, p. 154. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyauco river, British Columbia.

—— veternus (M. & H.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, pp. 406, 407. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— veternus (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 40, pl. 3, fig. 6. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Vicinity of the Black hills.

—— veternus (M. & H. ?) White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 21, pl. 4, figs. 20, 21. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

—— (Bathyomphalus) amplexus (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 539, pl. 42, figs. 16*a*, *b*, *b*, *d*, *e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the mouth of Judith river, on the Missouri in Montana.

—— (Bathyomphalus) amplexus (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 83. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Planorbis—Continued.

—— **(Bathyomphalus) amplexus** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 41, pl. 27, figs. 19, 20. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Judith river beds.

—— **(Bathyomphalus) kanabensis** n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 119. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, Utah.

—— **(Bathyomphalus) kanabensis** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 41, pl. 27, figs. 21, 23. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southern Utah.

—— **(Gyraulus) militaris** n. s. White (1880.)
Proc. U. S. Nat. Mus., vol. 3, pp. 159, 160, Wash., 1880, Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous.
Location: Head of Soldier's fork, Utah.

—— **(Bathyomphalus) planoconvexus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 538, 539, pl. 44, figs. 9*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fort Berthold, Dak., on the Missouri river.

—— **(Bathyomphalus) planoconvexus** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 83. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **(Bathyomphalus) planoconvexus** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 41, pl. 27, figs. 17, 18. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Fort Union beds.

—— **?** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Mellis station, Wyo.

Planorbulina ariminensis (d'Orb. sp.) Dawson. (1874.)
Canadian Naturalist, vol. 7, n. ser., p. 255, fig. 1, *d*, p. 253. Montreal, 1875. G. M. Dawson.
Formation: Cretaceous.
Location: About twenty miles north of the forty-ninth parallel, on the escarpment called Pembina mountain, Manitoba.

Planorbulina—Continued.

—— **farcata var. ariminensis** (d'Orb.) Dawson. (1875.)
British and N. Am. Bound. Com., Rep. Geol. and Res. 49th par., p. 79, pl. 17, fig. 2*c*. Montreal, 1875. G. M. Dawson.
Formation: Cretaceous.
Location: Boyne river, Manitoba, Canada.

Planularia Morton. (1842.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 214. Phila., 1839–1842. S. G. Morton.

—— **cuneata** n. s. Morton. (1842.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, pp. 214, 215, pl. 11, fig. 5. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **elongata** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 10. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Planulina globigerina Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 26. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **mississippica** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 41. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **nebulosa** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 35. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **oligosticta** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 43. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **suboctonaria** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 48. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Platytrochus Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 399. Phila., 1858–1860. W. M. Gabb.

—— **speciosus** (G. & H.) Gabb. (1860).
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 399, 400, pl. 69, figs. 15–17. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, N. J.

Pleurites ? americanus Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 20. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Pleurocera coalescens n. s. Roemer. (1888.)

Paleont. Abhandl. Vierter Band. Heft. 4, pp. 7, 8, Taf. 1 [xxxi], fig. 3. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Barton's creek, near Austin, Tex.

—— strombiformis (Schloth.) Hill. (1888.)

Ann. Rep. Geol. Sur. Arkansas, for 1888, vol. 2, pp. 129, 130, pl. 2, figs. 1-7, 7*a*, 7*b*, 8-12, 12*a*; pl. 3, figs. 6, 6*a*, 6*b*, 6*c*. Little Rock, 1888. R. T. Hill.

Formation: Cretaceous.

Location: Gypsum bluff, Little Missouri river, Pike county, Ark.

—— texana n. s. Roemer. (1888.)

Paleont. Abhandl. Vierter Band. Heft. 4, p. 7. Taf. 1 [xxxi], fig. 2. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Barton's creek, near Austin, Tex.

Pleurolimnæa n. subgen. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 533. Wash., 1876. F. B. Meek.

Pleuromya (Agas.) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 178. Phila., 1869. W. M. Gabb.

—— (?) carlottensis n. s. Whiteaves. (1876.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 57-59, pl. 9, fig. 8. Montreal, 1876. J. F. Whiteaves.

Formation: Cretaceous.

Location: Queen Charlotte island.

—— carlottensis Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 170. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Rocky Mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— lævigata n. s. Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser., 1886, app. I, p. 113 B. Montreal, 1887. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nookneamish river, northwest end of Vancouver island.

—— lævigata Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 155. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Nookneamish river, northwest end of Vancouver island.

—— newtoni n. s. Whitfield. (1877.)

U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont., Black Hills, pp. 20, 21. Wash., 1877. R. P. Whitfield.

Formation: Jurassic.

Location: Two miles south of Belle Fourche, Black hills, Dak.

Pleuromya—Continued.

—— newtoni Whitfield. (1880.)

Rep. Geol. Black Hills of Dakota, pp. 367, 368, pl. 5, figs. 19, 20. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: On top of the highest hills two miles south of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— papyracea n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 178, 179, pl. 29, fig. 66. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Cottonwood creek, Cal.

—— subcompressa (Meek) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 222, pl. 29, fig. 6. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Alliford bay.

—— subcompressa var. carlottensis Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 223, pl. 29, figs. 7, 7*a*. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Alliford bay; east end of Maud island; Felsites of Sigutlat lake and the Iltasyouco river, mainland of British Columbia.

—— (subcompressa ? var.) lævigata n. var. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 224, 225, pl. 30, figs. 1, 1*a*-*c*. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Alliford bay; east end of Maud island.

—— subcompressa var. lævigata Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 249, pl. 33, fig. 3. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Maud island.

—— subelliptica (M. & H.) Whiteaves. (1878.)

Can. Nat., vol. 8, n. ser. No. 7, p. 406. Montreal, 1878. J. F. Whiteaves.

Formation: Jurassic.

Location: Iltasyouco river.

—— subelliptica (M. & H.) Whiteaves. (1878.)

Geol. Sur. Can.; Rep. Prog. for 1876-1877, p. 155. Montreal, 1878. J. F. Whiteaves.

Formation: Jurassic.

Location: Iltasyouco river, British Columbia.

—— unionides (Roemer sp.) Whiteaves. (1878.)

Can. Nat., vol 8, n. ser. No. 7, p. 406. Montreal, 1878. J. F. Whiteaves.

Formation: Jurassic.

Location: Sigutlat lake and Iltasyouco river.

Pleuromya—Continued.

—— **unionides** (Roemer sp.) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–1877, pp. 155, 156. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake and Iltasyouco river, British Columbia.

Pleurotoma (Lam.) Shumard. (1861.)
Proc. Bost. Soc. Nat. Hist., vol. 8, 1861–1862, p. 197. Boston, 1862. B. F. Shumard.

—— **minor** n. s. E. & S. (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 40, 41. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Moreau and Grand rivers.

—— **mullicaensis** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 95, pl. 2, fig. 8. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, N. J.

—— **texana** n. s. Shumard. (1861.)
Proc. Bost. Soc. Nat. Hist., vol. 8, 1861–1862, p. 197. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Near Red river, Lamar county, Tex.

Pleurotomaria (Def.) Shumard. (1861.)
Proc. Bost. Soc. Nat. Hist., vol. 8, 1861–1862, p. 198. Boston, 1862. B. F. Shumard.

—— **austinensis** n. s. Shumard. (1861.)
Proc. Bost. Soc. Nat. Hist., vol. 8, 1861–1862, p. 198. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Near Austin, Tex.

—— **rhodani** (d'Orb.) Eichwald. (1871.)
Geogr. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 119. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

—— **skidegatensis** n. s. Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 51–53, pl. 9, figs. 6, 6*a*. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **skidegatensis** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 249. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

—— **sp. undet.** Roemer. (1849.)
Texas, p. 414. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, near New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)
Kreide von Tex., p. 39. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe, near New Braunfels, Tex.

Pleurotomaria—Continued.

—— **sp. undet.** Roemer. (1852.)
Kreide von Tex., p. 39. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp, on the Guadalupe, above New Braunfels, Tex.

—— **sp. undet.** Haughton. (1856.)
Jour. Roy. Dublin Soc., vol. 1, No. 4, p. 245, pl. 9, fig. 8. Dublin, 1858. S. Haughton.
Formation: Jurassic.
Location: Point Wilkie, Prince Patrick's land.

—— **?** Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 307, pl. 48, fig. 28. Phila., 1858–1860. W. M. Gabb.
Formation: Triassic?
Location: Bath county, Va.

Plicatula (Lam.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 62. Phila., 1834. S. G. Morton.

—— **arenaria** n. s. Meek. (1876.)
Rep. Expl. Exped. Santa Fe, N. Mex., to junction of Grand and Green rivers, pp. 126, 127, pl. 1, figs. 5*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Covero.

—— **hydrotheca** n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 113. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Head of Water pocket canyon, southern Utah.

—— **hydrotheoa** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 279, pl. 6, figs. 3*a*, *b*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Head of Water pocket canyon, southern Utah.

—— **incongrua** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 153, pl. 6, figs. 10*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: [Texas.]

—— **perimbricata** n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 16, 17, pl. 6, fig. 15 *a*. Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Volcano, about thirty miles southeast of Walker's lake, Nev.

—— **placunea ?** (d'Orb.) Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 7. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Washita beds from Fort Worth to Denison, Tex.

—— **saffordi** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 283, pl. 46, fig. 34. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tennessee.

Plicatula—Continued.

—— tetrica n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 283, pl. 46, fig. 26. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— urticosa n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 62, pl. 10, fig. 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey and Alabama.

—— urticosa (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 61, pl. 9, figs. 1, 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold and Holmdel, N. J.

—— variata n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 203, pl. 26, fig. 190. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Battle creek, Shasta county, Cal.

Pliophlœa n. g. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 150. Phila., 1862–1863. Gabb & Horn.

—— sagena n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 150, 151, [pl. 20], fig. 34. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, and near Mullica hill, N. J.

—— sagena (G. & H.) Cook. (1868.)
Ann. Rep. Geol. Sur., New Jersey, for 1868, p. 376, fig. —. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

Pollicipes maximus (Sow.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 241. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Turtle hill, N. J.

Polorthus n. g. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 366, 367. Phila., 1862. W. M. Gabb.

—— americana Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 367. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Alabama and Mississippi, Timber creek, N. J.

—— americanus Gabb. (1872.)
Proc. Acad. Nat. Sci., Phila., for 1872, pp. 260–262, pl. 8, fig. 8. Phila., 1872. W. M. Gabb.
Formation: Cretaceous.
Location: [New Jersey.]

—— tibialis (Morton sp.) Gabb. (1872.)
Proc. Acad. Nat. Sci., Phila., for 1872, pp. 259–262, pl. 8, figs. 1–7. Phila., 1872. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

Polymorphina (d'Orb.) Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band XLIV, p. 338. Wien, 1862. A. E. Reuss.

—— subrhombica n. s. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb., 1861, Band XLIV, p. 339, Taf. VII, fig. 3. Wien, 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

Polynema n. subgen. Conrad. (1875.)
Rep. Geol. Sur., N. C., vol. 1, Raleigh, 1875. W. C. Kerr. App. A, p. 4. T. A. Conrad.

Polyrhytis n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 532. Wash., 1876. F. B. Meek.

Popanoceras mcconnelli n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 138–140, pl. 18, figs. 2, 2a, *b*, 3, 3a. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about twenty-five miles below Devil's Portage, Canada.

Portlandia (subgen. Morch.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 107. Wash., 1876. F. B. Meek.

Posidonia ovata n. s. Lea. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 78. Phila., 1857. Isaac Lea.
Formation: [Triassic].
Location: Phœnixville, Pa.

—— parva n. s. Lea. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 78. Phila., 1856. Isaac Lea.
Formation: [Triassic].
Location: Phœnixville, Pa.

Posidonomya blatchleyi n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869–1870, pp. 13, 14, pl. 6, fig. 12. Phila., 1870. W. M. Gabb.
Formation: Triassic.
Location: New pass, west of Austin [Nev.].

—— daytonensis n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 32, 33, pl. 6, fig. 32. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Eldorado canyon, Nev., near Dayton.

—— stella n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 32, pl. 6, fig. 31. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Star canyon, Humboldt mining region, Nev.

—— ? —— Lyell. (1847.)
Quart. Jour. Geol. Soc. Lond., vol. 3, p. 275, fig. 6a. London, 1847. C. Lyell.
Formation: Jurassic? [Triassic].
Location: Near Blackheath, Va.

Posidonomya—Continued.

—— (Bronn.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 32. Phila., 1864. W. M. Gabb.

—— sp. undet. Ramirez. (1880.)
An. Min. Fomento Rep. Mex., Tomo 3, p. 656, Lam. 1, fig. 2. Mexico, 1880. S. Ramirez.
Formation: Cretaceous. [?]
Location: Sierra Mojada, Mexico.

Potamides (Brongn.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 130. Phila., 1864. W. M. Gabb.

—— **diadema** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 130, pl. 20, fig. 85. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Cal.

—— **tenuis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 130, 131, pl. 20, fig. 86. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, twelve miles north of Oroville, Butte county, Cal.

—— **tenuis** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 121, pl. 15, figs. 8, 8*a*, *b*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Denman island, southwest side of Denman island, Sucia islands.

—— **tenuis** var. **nanaimoensis** n. var. Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, pp. 121, 122, pl. 15, figs. 9, 9*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island, Nanaimo river, Vancouver island.

Prionocyclus n. g. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 452–455. Wash., 1876. F. B. Meek.

—— **typical** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 453. Wash., 1876. F. B. Meek.

——? **macombi** n. s. Meek. (1876.)
Rep. Expl. Exped. Santa Fe, N. Mex., to junction of Grand and Green rivers, pp. 132, 133, pl. 2, figs. 3*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Banks of Canadian.

—— **wyomingensis** (Meek) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 440, 441, pl. 14, figs. 1–3. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the east fork of Beaver creek, near Camp Jenney, Black hills.

—— **wyomingensis** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 35, 36, pl. 15, figs. 1*a*–*e*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Medicine Bow river, Wyo.

Prionocyclus—Continued.

—— (**Prionotropis**) **woolgari** (Mant. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 455–457, pl. 7, figs. 1*a*–*k*, pl. 6, fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Southwest base of the Black hills, Dak.; northeastern Nebraska; Drift of northwestern Iowa; New Mexico; eight miles north of Fort Lyon, Colo.

Prionotropis n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 453. Wash., 1876. F. B. Meek.

Proroporus obtusus Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 23, 24 ? Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Protocardia subgen. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 266. Phila., 1856. T. A. Conrad.

—— (subgen. Beyrich) Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 149. Wash., 1857. T. A. Conrad.

—— (Beyrich typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 172. Wash., 1876. F. B. Meek.

—— subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 215. Wash., 1876. F. B. Meek.

—— **borealis** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 41, 42, pl. 6, figs. 1, 1*a*, 2, 2*a*, 3. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: St. Mary river, near its junction with the Belly river; St. Mary river, west of McLeod Benton trail; South Saskatchewan, opposite Swift Current creek; three miles north of Ross coulee, near Irvine station, on the Canadian Pacific railway, Canada.

—— **borealis** Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 177. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: "The Nose," township 27, range 8, west of the fourth principal meridian, Northwest Territory.

—— n. s. **carolinensis** Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A., p. 7, pl. 2, fig. 21. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— **hillana** (?) var. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 169. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

Protocardia—Continued.

—— rara (E. & S.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 183. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek, Colo.

—— shumardi M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 98, 99, figs. A and B, text. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills.

—— subquadrata (E. & S. sp.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 183. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek; mouth of Saint Vrains creek, Colo.

—— subquadrata (E. & S.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can, Paleont., vol. 1, pt. 1, p. 41, pl. 5, figs. 4, 4a. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, opposite Swift Current creek; Bull's head, about twenty-two miles west of the west end of the Cypress hills; three miles north of Ross coulee, near Irvine station, on the Canadian Pacific; four miles south of Battle river, township 38, between ranges 12 and 13, west of fourth meridian, Canada.

—— subquadrata (E. & S) Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 177. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sounding creek, township 30, range 8, west of the fourth principal meridian, Northwest Territory.

—— subscitula Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 360, 361, pl. 3, figs. 4, 4a. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Komooks, Vancouver island.

—— (Leptocardia ?) pertenuis (M. & H.) Meek (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 176, 177, figs. 13, 14, p. 176. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Deer creek, on the North Platte.

—— (Leptocardia) rara (E. & S. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 176, pl. 17, figs. 1*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On the Yellowstone river, one hundred and fifty miles above its mouth.

Protocardia—Continued.

—— (Leptocardia) subquadrata (E. & S. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 175, pl. 28, figs. 8*a*–*e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Long lake, Fox hills, etc.

—— (Protocardia) salinaensis Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 174, pl. 2, figs. 13*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

Protocardium (Beyrich) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 136. Wash., 1885. R. P. Whitfield.

—— hillanum (Sow. sp.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 228, pl. 30, fig. 5. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island.

—— scitulum (Meek sp.) Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 155. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Blunden point, Vancouver island, two miles and a quarter and two miles and a half up the Nanaimo river; Sucia islands.

—— sp. undet. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 250, pl. 33, fig. 5. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

Psammobia (Lam.) Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, p. 24. Wash., 1877. R. P. Whitfield.

—— cancellato-sculpta n. s. Roemer. (1852.)
Kreide von Tex., p. 46, Taf. 6, figs. 10, a, b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— obscura n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 61, pl. 10, figs. 4–6. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Palace camp and Carbonado, Wash.

—— ? prematura n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, p. 24. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: East of the Belle Fourche, Black hills, Dak.

Psammobia—Continued.

—— **? prematura** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 374, pl. 5, fig. 31. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: East of the Belle Fourche river, near Bear lodge butte, Black hills.

—— sp. undet. Roemer. (1849.)
Tex., p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

Pseudobuccinum n. g. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 140. Phila., 1858. Meek & Hayden.

—— **nebrascense** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 350, 351, pl. 31, figs. 5*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— **nebrascensis** M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, pp. 140, 141. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post and Fox hills, Nebr.

—— **nebrascense** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 185. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek, Colo.

Pseudocardia n. g. Conrad. (1866.)
Am. Jour. Conch., vol. 2, p. 103. Phila., 1866. T. A. Conrad.

Pseudocidaris saussurei (de Loriol) Cotteau. (1890.)
Bull. Soc. Geol., France, 3d ser., vol. 18, p. 294. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: San-Juan-Raya (Puebla), Mexico.

Pseudodiadema n. g. Desor. (1858.)
Synop. Echinoides Foss., pp. 63, 64. Paris and Wiesbade, 1858. E. Desor.

—— **diatretum** (Morton sp.) Desor. (1858.)
Synop. Echinoides Foss., p. 73. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Gloucestershire, N. J.

—— **texanum** (Roemer sp.) Desor. (1858.)
Synop. Echinoides Foss., p. 72. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Fredericksburg and San Saba valley, Tex.

Pseudoliva (Swains.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 99. Phila., 1864. W. M. Gabb.

Pseudoliva—Continued.

—— **lineata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 99, pl. 18, fig. 52. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Northeast of Martinez, Cal.

—— **volutæformis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 99, pl. 28, fig. 212. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

Pseudomelania (?) sp. undet. Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 49, 50. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte island.

Pseudomonotis (Bronn.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 354. Wash., 1880. R. P. Whitfield.

—— **(Eumicrotis) curta** (Hall) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 354–356, pl. 3, figs. 20–25. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Two miles south of the Belle Fourche river, near Bear Lodge butte; on Beaver creek; on Red canyon creek, near the Cheyenne; and in Redwater valley, Black hills.

—— **(Eumicrotis) orbiculata** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. region; Prelim. Rep. Paleont., Black Hills, p. 17. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater Valley, Black hills, Dak.

—— **(Eumicrotis) orbiculata** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 356, 357, pl. 3, figs. 17–19. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater valley, Black hills.

Pseudonautilus n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 491. Wash., 1876. F. B. Meek.

Pseudoptera n. subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 29. Wash., 1876. F. B. Meek.

Psilomya (subgen. Meek) White. (1874.)
Prelim. Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian. G. M. Wheeler, p. 26. Wash., 1874. C. A. White.

Pteria (Scopoli) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 79. Wash., 1865. Meek & Hayden.

—— **gastrodes** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Pteria—Continued.

—— **haydeni** (H. & M.) **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 33, 34, pl. 16, figs. 2*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Great bend of the Missouri, below Fort Pierre.

—— **haydeni** (H. & M.) **White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 180. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Mouth of Saint Vrains creek, Colo.

—— **laripes** (Mort.) **Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 69, 70, pl. 14, fig. 9. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Delaware?

—— **linguiformis** (E. & S. sp.) **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 32, 33, pl. 16, figs. 1*a*–*d*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Great bend of the Missouri, below Fort Pierre, Sage creek, Fox hills, Long lake, etc.

—— **linguiformis** (E. & S.) **White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 180. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Fossil ridge, Colo.

—— **linguiformis** (E. & S.) **White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Bear creek, near Morrison, Colo.

—— **linguiformis** (E. & S.) **White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Sage creek, Colo.

—— **linguiformis** (E. & S.) **Whitfield.** (1880.)

Rep. Geol. Black Hills of Dak., pp. 384, 385, pl. 7, figs. 2, 3. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the South fork of the Cheyenne river, near French creek, and on Old Woman fork, Black hills.

—— **linguiformis** (E. & S. sp.) **Whiteaves.** (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 31. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Elbow of South Saskatchewan; South Saskatchewan, fifteen miles west of Swift Current creek; Bull's head, about twenty-two miles west of the west end of the cypress hills; three miles north of Ross coulee, near Irvine station, on the Canadian Pacific railway, Canada.

Pteria—Continued.

—— **linguiformis** var. **subgibbosa** n. var. **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 33, pl. 28, fig. 12. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Long lake.

—— **linguiformis** var. **subgibbosa** (Meek) **Whiteaves.** (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 174. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Battle river, township 46, range 4, west of the fourth principal meridian, Northwest Territory.

—— **navicula** n. s. **Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 70, 71, pl. 14, fig. 8. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **parkensis** **White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 279, 280, pl. 3, fig. 3*a*. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: South of Grand river, Middle park, Colo.

—— **petrosa** (Con.) **Whitfield.** (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 68, 69, pl. 14, fig. 10. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: At or near Keyport, N. J.

—— ? **stabilitatis** n. s. **White.** (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 15, pl. 17, fig. 3*a*. Wash., 1883. C. A. White.

Formation: Cretaceous.

Location: Collin county, Tex.

—— (**Oxytoma**) **corneuiliana** (d'Orb.) **Whiteaves.** (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 166, 167, pl. 23, figs. 1, 1*a*, *b*. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— (**Oxytoma**) **erecta** n. s. **White.** (1880.)

Proc. U. S. Nat. Mus., vol. 3, pp. 157, 158. Wash., 1880. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

Formation: Cretaceous.

Location: Lower Potato valley, Southern Utah.

—— (**Oxytoma**) **erecta** **White.** (1881.)

Proc. U. S. Nat. Mus., vol. 4, p. 139, pl. 1, figs. 7, 8. Wash., 1881. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

—— (**Oxytoma?**) **gastrodes** (Meek) **White.** (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 280, 281, pl. 10, fig. 1*a*. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

Pteria—Continued.

—— **(Oxytoma) munsteri** (Bronn) Meek. (1864.)

Check List Invert. Foss. N. Am. Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 39. Wash., 1864. F. B. Meek.
Formation: Jurassic.
Location: Dakota; Idaho.

—— **(Oxytoma) munsteri** (Goldf.) M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 80, 81, figs. A and B, text. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Wind river valley, Dak.

—— **(Oxytoma) nebrascana** (E. & S.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 34–36, pl. 16, 3*a*, *b*; and pl. 28, fig. 11. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fox hills, Moreau river, South Fork of the Cheyenne, Milk river above Fort Union, and on the Yellowstone.

—— **(Oxytoma) nebrascana** (E. & S.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 180. Wash., 1879. C. A. White.

—— **(Oxytoma) nebrascana** (E. & S.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 385, 386, pl. 7, fig. 4. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Sage creek, Black hills.

—— **(Oxytoma) nebrascana** (E. & S.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 31. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: "South Branch of the Saskatchewan;" South Saskatchewan opposite Swift Current creek, Canada.

—— **(Oxytoma) nebrascana** (E. & S. sp.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 56. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Milk river ridge, Canada.

—— **(Oxytoma) nebrascana** (E. & S.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 79. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky spring ridge, near MacLeod-Benton trail; Milk river, about three miles west of crossing of MacLeod-Benton trail; and west flank of West Butte, Mont., in the sweet grass hills, near to the international boundary-line.

Pteria—Continued.

—— **(Oxytoma) salinensis** n. s. White. (1879.)

Proc. U. S. Nat. Mus., vol. 2, pt. 2. pp. 296, 297, pl. 5, figs. 1, 2, Wash., 1880, Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Saline county, Kans.

—— **(Oxytoma) salinensis** White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 15, 16, pl. 16, figs. 2*a*, *b*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Saline county, Kans.

—— **(Pseudoptera) fibrosa** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 36, 37, pl. 17, figs. 17*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Forks of Cheyenne river; on North Platte river, near the mouth of Deer creek.

—— **(Pseudoptera) fibrosa** (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197, Wash., 1879, C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— **(Pseudoptera) fibrosa** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 386, pl. 7, fig. 5. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Rapid creek.

—— **(Pseudoptera) fibrosa** (M. & H.) var. Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 32, 33, pl. 4, fig. 1. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bow river, below Horseshoe bend, Canada.

—— **(Pseudoptera) propleura** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 281–284, pl. 10, figs. 2*a–c*. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Pseudoptera) propleura** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **(Pseudoptera) rhytophora** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 234. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Pteria—Continued.

—— **(Pseudoptera) sublævis** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, p. 29. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: Old Woman's fork, Black hills, Dak.

—— **(Pseudoptera) sublævis** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 387, pl. 7, fig. 6. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Old Woman fork, Black hills.

Pterocerella n. g. Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 36. Wash., 1864. F. B. Meek.

—— **tippana** (Con.) Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 36. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Mississippi.

—— **tippana** (Conrad) Gabb. (1868.)
Am. Jour. Conch., vol. 4, p. 147, pl. 14, fig. 20. Phila., 1868. W. M. Gabb.
Formation: Cretaceous.

Pterodonta inflata (d'Orb.) Ramirez. (1880.)
An. Min. Fomento Rep. Mex., Tomo 3, p. 657, Lam. 2-4. Mexico, 1880. S. Ramirez.
Formation: Cretaceous.
Location: Sierra Mojada, Mexico.

—— ? **sp. undet.** Urquiza. (1882.)
An. Min. Fomento Rep. Mex., Tomo 7, p. 224, fig. 13. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Cerro de los Guzmanes, Coalcoman district, state of Michoacan, Mexico.

Pteroperna —— ? Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 403. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— —— (?) Whiteaves. (1878.)
Geol. Sur. Can.; Rep. Prog. for 1876-1877, p. 153. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

Ptiloteuthis n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 128. Phila., 1869. W. M. Gabb.

—— **foliatus** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 128, 129, pl. 19, fig. 4. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Shasta county, Cal.

Ptychoceras (d'Orb.) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861-1862, p. 190. Boston, 1862. B. F. Shumard.

Ptychoceras—Continued.

—— **æquicostatus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 74, pl. 13, fig. 20. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Aldersons gulch, and Eagle creek, Shasta county, Cal.

—— **aratus** n. s. Conrad. (1874.)
Seventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 455. Wash., 1874. T. A. Conrad.
Formation: Cretaceous.
Location: Trout creek, near Fairplay [Colo.].

—— **crassum** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, pp. 45, 46. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman's fork, Black hills.

—— **crassum** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 459, pl. 16, figs. 3-5. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman fork, Black hills.

—— **crassum** (Whitfield) Stanton. (1887.)
Proc. Colorado Sci. Soc., vol. 2, pt. 3, for 1887, pp. 185, 186. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— **meekanum** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur., Rocky Mt. region, Prelim. Rep. Paleont. Black Hills, pp. 44, 45. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On Beaver creek, Black hills.

—— **meekanum** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 457, 458, pl. 16, figs. 1, 2. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Beaver Creek, Black hills.

—— **mortoni** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 134. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Great bend of the Missouri, Nebr.

—— **mortoni** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 412, 413, pl. 20, figs. 4a-c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri river, below Fort Pierre.

—— **mortoni** (M. & H.) Stanton. (1887.)
Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 186. [Denver, 1888.] T. W. Stanton.
Formation: Cretaceous.
Location: About five miles north of the town of Boulder, Colo.

—— **texanus** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 190. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Near Chatfield point and Corsicana, Navarro county, Tex.

Ptychoceras—Continued.

—— vancouverense n. s. Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol, 1, pt. 2, pp. 113, 114, pl. 14, figs. 3, 3a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Banks of the Trent river, Vancouver island.

—— (? Hamites) quadratus n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 74, 75, pl. 15, fig. 21, pl. 14, figs. 21, a. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, Butte county, Cal.

Ptychosycoa n. g. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 294. Phila., 1876. W. M. Gabb.

—— inornata n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 295, pl. 17, figs. 2-4. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Ptygostomum senarium Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 27. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— quinarium Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 28. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

Pugnellus n. g. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 284. Phila., 1858-1860. T. A. Conrad.

—— densatus Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 284. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.

—— hamulus n. s Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 124, 125, pl. 20, fig. 81; pl. 18, fig. 48. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Southwest of Martinez, Cal.

—— hamulus Gabb. (1868.)

Am. Jour. Conch., vol. 4 p. 139, pl. 13, figs. 1-3. Phila., 1868. W. M. Gabb.
Formation: Cretaceous.

—— hamulus Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 162, 163, pl. 27, figs. 42, 42a. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— manubriatus n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 125, 126, pl. 29, fig. 229. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cottonwood creek, Siskiyou county, Cal.

Pugnellus—Continued.

—— typicus n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 298. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— (Gymnarus) manubriatus Gabb. (1868.)

Am. Jour. Conch., vol. 4, p. 139, pl. 13, figs. 4, 5. Phila., 1868. W. M. Gabb.
Formation: Cretaceous.
Location: California.

—— (Gymnarus) Gabb. (1869.)

Geol. Sur. Gal. Paleont., vol. 2, p. 163, Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

Pulvinites (Defrance) Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 330. Phila., 1855-1858. T. A. Conrad.

—— argentea n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 330, pl. 34, fig. 5. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— argentea Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 298, pl. 46, fig. 51. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.

—— argentea Conrad. (1867.)

Am. Jour. Conch., vol. 3, pp. 9, 10. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.

Pupa helicoides n. s. (M. & H.) (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, pp. 118, 119. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles above Fort Union.

Purpura (Brug.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 301. Phila., 1858-1860. W. M. Gabb.

—— (Morea) naticella n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 301, pl. 48, fig. 15. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

Purpuroidea (Lycett) Gabb. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 94. Phila., 1861. W. M. Gabb.

—— ? dubia n. s. Gabb. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 94, pl. 2, fig. 11. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Mullica hill, N. J.

Pycnodonta vesicularis (Lam.) Cook. (1868.)
Ann. Rep. Geol. Sur. New Jersey for 1868, p. 374, fig. —. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

—— **vesicularis** n. var. Cook. (1868.)
Ann. Rep. Geol. Sur. N. J. for 1868, p. 374, fig. —. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

Pyrgulifera Meek. (1876.)
Rep. Expl. Great Basin, Terr. Utah, p. 363. Wash., 1876. F. B. Meek.

—— **humerosa** Meek. (1876.)
Rep. Expl. Great Basin, Terr. Utah, p. 363, pl. 5, figs. 6*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Bear river, near the mouth of Sulphur creek.

—— **humerosa** Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 176–178, pl. 17, figs. 19, 19*a*; fig. 6. p. 177. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Sulphur creek, near Bear river, Wyo.

—— **humerosa** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **humerosa** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 96. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, Wyo.

—— **humerosa** (Meek) White. (1882.)
Proc. U. S. Nat. Mus., vol. 5, p. 98, pl. 3, figs. 10–12. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming; and Utah.

—— **humerosa** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 54, pl. 6, figs. 4–6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

Pygurus (d'Orb.) Desor. (1858.)
Synop. Echinoides Foss., pp. 309, 310. Paris and Wiesbade, 1858. E. Desor.

—— **geometricus** (Morton sp.) Desor. (1858.)
Synop. Echinoides Foss., p. 313. Paris and Wiesbade, 1858. E. Desor.
Formation: Cretaceous.
Location: Delaware.

—— **geometricus** (Agas.) d'Orb.
Paleont. Francaise, Echinoides Irreguliers, Terr. Cret. t. Sixieme, pp. 313, 314, pl. 920, fig. 4. Paris, 1853–1860. A. d'Orbigny.
Formation: Cretaceous.
Location: Delaware canal.

Pyrifusus n. g. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332. Phila., 1855–1858. T. A. Conrad.

—— (**Conrad typical**) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 344. Wash., 1876. F. B. Meek.

—— **newberryi** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 81. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: West flank of West butte, Mont., in the Sweet Grass hills, and near the forty-ninth parallel.

—— **subdensatus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332, pl. 35, fig. 12. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— (**Neptunella**) **intertextus** (M. & H. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 348, 349, pl. 19, figs. 14*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles above its mouth.

—— (**Neptunella**) **newberryi** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 346, 347, pl. 31, figs. 6*a–f* and fig. 39, p. 346. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fox hills, Moreau trading post, and Long lake, Dak.; also on the Yellowstone river, one hundred and fifty miles above its mouth.

—— (**Neptunella**) **subturritus** (M. & H. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 347, 348, pl. 32, figs. 3*a*, *b*, and fig. 40, p. 347. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Grand river.

Pyrina (Desmoul.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 276. Phila., 1869. W. M. Gabb.

—— **parryi** n. s. Hall. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, pp. 144, 145, pl. 1, figs. 1*a–d*. Wash., 1857. James Hall.
Formation: Cretaceous.
Location: Leon springs, El Paso road [Tex.].

—— **parryi** (Hall) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 276. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mex.

Pyripora (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 157. Phila., 1862, 1863. Gabb & Horn.

—— **irregularis** G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 157 [pl. 20], fig. 40. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek and near Mullica hill, N. J.

Pyropsis (Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 368, 369. Wash., 1876. F. B. Meek.

—— **alabamensis** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 285, 286. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Mississippi; Vincentown, N. J.

—— **bairdi** (M. & H. sp.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 369–371, pl. 31, figs. 10*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fox hills and other localities near Moreau river.

—— **bairdi** (M. & H. sp.) (Meek) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 284. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— **bairdi var. rotula** n. var. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 371, 372, pl. 31, figs. 10c, 47, p. 371. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fox hills and other localities near Moreau river.

—— **elevata** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 284. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **richardsonii** (Tuomey sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 284. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey; Prairie bluff, Ala.; Pataula creek, Ga.

—— **septemlivata** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 285. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— ? **trochiformis** (Tuomey sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 285. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey; Uniontown, Ala.

Pyrula bairdi n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 66. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river and Fox hills, Nebr.

—— **glabra** n. s. Shumard. (1858.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 125. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island.

—— **sp. undet.** Roemer. (1849.)
Texas, p. 415. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall, near New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)
Kreide von Tex., p. 37. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe, below New Braunfels, Tex.

Quadrula (subgen. Raf.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Radioconcha n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 47. Phila., 1870. T. A. Conrad.

Radiolites (Lam.) Barcena. (1877.)
Am. Museo Nac. Mex., Tomo 1, p. 198, Mexico, 1877–1879. M. Barcena.

—— **austinensis** Roemer. (1852.)
Kreide von Tex., pp. 77–79, Taf. 6, figs. *a–d*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Austin, Tex.

—— **foliaceus** ? (Lam.) Urquiza. (1882.)
An. Min. Fomento Rep. Mex., Tomo 7, p. 223, fig. 8. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Road to Rincon, Coalcoman district, State of Michoacan, Mexico.

—— **mendozæ** n. s. ? Barcena. (1877.)
An. Museo Nac. Mex., Tomo 1, pp. 198, 199, figs. 16, 17. Mexico, 1877–1879. M. Barcena.
Formation: Cretaceous.
Location: States of Queretaro, Michoacan, Vera Cruz, Guerrero, and San Luis Potosi, Mexico.

—— **turbinatus** (Lam.) Urquiza. (1882.)
An. Min. Fomento Rep. Mex., Tomo 7, p. 223, fig. 7. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Road to Rincoro, Coalcoman district, State of Michoacan, Mexico.

—— **sp. undet.** Roemer. (1852.)
Kreide von Tex., p. 77. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Sabine creek between New Braunfels and Fredericksburg, Tex.

Radix (subgen. Montfort) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 532. Wash., 1876. F. B. Meek.

Radula (Klein) Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 99. Phila., 1870. T. A. Conrad.

—— **acutilineata** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 62, 63, pl. 9, figs. 6, 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **denticuticosta** (Gabb sp.) Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 99, pl. 9, fig. 17. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **oxypleura** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1, Raleigh, 1875. W. C. Kerr. App. A, p. 2, pl. 1, fig. 5. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— **pelagica** (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 61, 62, pl. 9, figs. 3–5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel and Freehold, N. J.

—— **reticulata** (L. & F.) Whitfield. (1885.)
Mong. U. S. Geol. Sur., vol. 9, pp. 63, 64, pl. 9, figs. 8, 9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Upper Freehold, N. J.

Rapa (Klein) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332. Phila., 1855–1858. T. A. Conrad.

—— **elevata** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 301, pl. 48, fig. 12. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Near Burlington, N. J.

—— **pyruloidea** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 94, pl. 2, fig. 4. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **supraplicata** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332, pl. 35, fig. 20. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Remondia n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 270. Phila., 1869. W. M. Gabb.

—— **ferrissii** n. s. Cragin. (1889.)
Bull. Washb. Col. Lab. Nat. Hist., vol 2, No. 10, p. 68. Topeka, 1889. F. W. Cragin.
Formation: Cretaceous.
Location: Kiowa county, near Belvidere, Kans.

Remondia—Continued.

—— **furcata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 270, 271, pl. 36, figs. 17, 17*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mex.

Reptescharellina (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 146. Phila., 1862, 1863. Gabb & Horn

—— **prolifera** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 146, 147 [pl. 20], fig. 28. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

Reptescharipora (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 151. Phila., 1862, 1863. Gabb & Horn.

—— **marginata** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 151, 152 [pl. 20], fig. 35. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill, N. J.

Reptocelleporaria (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 131. Phila., 1862, 1863. Gabb & Horn.

—— **aspera** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 131, 132 [pl. 19], fig. 14. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek and near Mullica hill, N. J.

Reptoflustrella (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, pp. 161, 162. Phila., 1862, 1863. Gabb & Horn.

—— ? **heteropora** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 162 [pl. 20], fig. 50. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Near Mullica hill and Timber creek, N. J.

Reptomulticava (d'Orb.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 401. Phila., 1858–1860. W. M. Gabb.

—— **cepularis** ? (Mort. sp.) G. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 367. Phila., 1861. Gabb & Horn.
Formation: Cretaceous.
Location: New Jersey.

—— **cepularis** (G. & H.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 401, pl. 68, figs. 33–35. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Timber creek, N. J.

Reptomulticava—Continued.

—— **cepularis** G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 177. Phila., 1862, 1863. Gabb & Horn.

Formation: Cretaceous.

Location: Timber creek, N. J.

Requienia (Math.) Conrad. (1854.)

Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 299. Phila., 1850–1854. T. A. Conrad.

—— **patagiata** n. s. White. (1884.)

Bull. U. S. Geol. Sur., No. 4, pp. 6, 7, pl. 1, figs. 1–8, pl. 2, figs. 1–4. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Vicinity of Austin, Tex.

—— **patagiata** (White) Roemer. (1888.)

Paleont. Abhandl. Vierter Band, Heft 4, pp. 12, 13, Taf. I [xxxi], fig. 16; Taf. III, [xxxiii], figs. *5a–c*. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Barton's creek, near Austin, Tex.

—— **senseni** Conrad. (1854.)

Jour. Acad. Nat. Sci. Phila., vol. 2, 2d ser., 1850–1854, p. 299, pl. 27, fig. 8. Phila., 1850–1854. T. A. Conrad.

Formation: Cretaceous.

Location: Missouri river, Nebr.

—— **texana** (Roem.) White. (1884.)

Bull. U. S. Geol. Sur., No. 4, p. 7, pl. 2, figs. 5–7. Wash., 1884. C. A. White.

Formation: Cretaceous.

Location: Vicinity of Austin, Tex.

Retelea (d'Orb.) G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 164. Phila., 1862, 1863. Gabb & Horn.

—— **ovalis** n. s. G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 164, [pl. 21], fig. 52. Phila., 1862, 1863. Gabb & Horn.

Formation: Cretaceous.

Location: Near Mullica hill, N. J.

Retepora (Lam.) Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.

—— (Lam.) Morton. (1829.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 124. Phila., 1827–1831. S. G. Morton.

Formation: Cretaceous.

Location: Big Timber creek, Gloucester county, N. J.

—— **sp. undet.** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 288. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: Gloucester county, N. J.

—— **sp. undet.** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 79, 80. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Reticulipora Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 400. Phila., 1858–1860. W. M. Gabb.

—— **dichotoma** n. s. G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 173 [pl. 21], fig. 64. Phila., 1862, 1863. Gabb & Horn.

Formation: Cretaceous.

Location: Timber creek, N. J.

—— **sagena** n. s. G. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 366. Phila., 1861. Gabb & Horn.

Formation: Cretaceous.

Location: New Jersey.

—— **sagena** (G. & H.) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 400, 401, pl. 69, figs. 30–32. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Timber creek, N. J.

—— **sagena** G. & H. (1862.)

Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 173. Phila., 1862, 1863. Gabb & Horn.

Formation: Cretaceous.

Location: Timber creek, N. J.

Rhodea (subgen. H. & A. Ad.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol 9, p. 555. Wash., 1876. F. B. Meek.

Rhynchonella (Fischer) Meek. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 39. Phila., 1864. F. B. Meek.

—— **æquiplicata** n. s. Gabb. (1864.)

Geol. Sur. Paleont., vol. 1, p. 35, pl. 6, figs. 37, 37*a*, *b*. Phila., 1864. W. M. Gabb.

Formation: Triassic.

Location: Cinnabar district, in the range east of the Humboldt mountains.

—— **gnathophora** n. s. Meek. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 39, 40, pl. 8, figs. 1*a–f*. Phila., 1864. F. B. Meek.

Formation: Jurassic.

Location: Genesee valley, Plumas county, Cal.

—— **gnathophora** ? (Meek) H. & W. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 284, 285, pl. 7, fig. 6. Wash., 1877. Hall & Whitfield.

Formation: Jurassic.

Location: Flaming gorge, Unita range, Utah.

—— **halli** n. s. Gabb. (1860.)

Jour. Acad, Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 308, pl. 48, figs. 29*a–c*. Phila., 1858–1860. W. M. Gabb.

Formation: Triassic.

Location: Bath county, Va.

—— **lingulata** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 34, pl. 6, figs. 36, 36*a*, *b*. Phila., 1864. W. M. Gabb.

Formation: Triassic.

Location: Star canyon, Humboldt county, Nev.

Rhynchonella—Continued.

—— **maudensis** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 252, pl. 33, figs. 8, 8a, b. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

—— **myrina** n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 284, pl. 7, figs. 1–5. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Flaming Gorge, Uinta range, Utah.

—— **myrina** (H. & W.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 247, pl. 3, figs. 6, 7. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Red canyon, Black hills, Dak.

—— **plicatilis** (Sow.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 200. St. Petersburg, 1871. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **whitneyi** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 204, 205, pl. 34, figs. 105a, b. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— —— M. & H. (1865.)
Paleont., Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 71, 72, pl. 3, fig. 4. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills, Dakota Territory.

—— **sp. undet.** Whiteaves. (1879.)
Geol. Sur. Can., Mess. Foss., vol. 1, pt. 2, p. 177. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— ——? White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 36. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia islands.

Rhynchopterus n. g. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 31, 32. Phila., 1864. W. M. Gabb.

—— **obesus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 32, pl. 5, figs. 30, a, b. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Rattlesnake point, near Humboldt city, Nev.

Rhytophorus Meek. (1876.)
Rep. Expl. Great Basin, Terr. Utah, p. 364. Wash., 1876. F. B. Meek.

Rhytophorus—Continued.

—— (?) **glaber** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 69, 70, pl. 10, figs. 4, 4a–c. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, east side of Driftwood bend, and Belly river near its junction with the Bow river; south side of the Milk river, one mile above Pa-kow-ki coulee; south Saskatchewan, one mile below the mouth of the Bow river; Driftwood bend, Canada.

—— **meekii** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 118, 119. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, near Mellis station, Wyo.

—— **meekii** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **meekii** White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur Terr., pt. 1, pp. 82, 83, pl. 30, figs. 8a, b. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, Bear river valley, Wyo.

—— **meekii** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 38, pl. 8, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming.

—— **priscus** Meek. (1876.)
Rep. Expl. Great Basin Terr. Utah, p. 364, pl. 5, figs. 4a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Bear river, near mouth of Sulphur creek.

—— **priscus** Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 175, 176, pl. 17, figs. 6, 6a. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Sulphur creek, on Bear river, Utah.

—— **priscus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 243. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **priscus** (Meek) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 82. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Near the mouth of Sulphur creek, in the valley of Bear river, Wyo.

Rhytophorus—Continued.

—— **priscus** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 38, pl. 8, figs. 2, 3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming.

Rimella ? (Agas.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 331. Phila., 1855-1858. T. A. Conrad.

—— (subgen. Agas.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 123. Phila., 1864. W. M. Gabb.

—— **curviliratus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 331, pl. 35, fig. 9. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **macilenta** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, pp. 19, 20, pl. 3, figs. 10–12. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: About two miles northward from New Idria, Fresno county, Cal.

Ringicula (Deshayes) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 192. Boston, 1862. B. F. Shumard.

—— **acutispira** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 193, 194. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Lamar county, Tex.

—— **pulchella** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 192, 193. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point, Navarro county, Tex.

—— **subpellucida** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 193. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar county, Tex.

Ringinella (d'Orb.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 174. Phila., 1869. W. M. Gabb.

—— **pinguis** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 175. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.

—— **polita** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 174, 175, pl. 28, fig. 60. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: South of the road from Colusa to the Hot sulphur springs in the first range of foothills, Colusa county, Cal.

Risso cretacea n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 100, 101, pl. 9, fig. 15. Phila., 1870. T. A. Conrad.
Formation : Cretaceous.
Location: Haddonfield, N. J.

Robulina ? **denaria** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 39. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **ocellus** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 47. Leipzig, 1854. C. G. Ehrenburg.
Formation: Cretaceous.
Location: Mississippi region.

Rosalina (d'Orb.) Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss., Sitzungsb., 1861, Band XLIV, p. 337. Wien., 1862. A. E. Reuss.

—— **bosqueti** n. s. Reuss. (1861.)
Math.-Naturw. Cl. Kaiserl. Akad. Wiss., Sitzungsb., 1861, Band XLIV, p. 337 [Taf. III, fig. 1]. Wien., 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

Rostellaria (Lam.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 48. Phila., 1834. S. G. Morton.

—— **sp.** Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 237. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **americana** n. s. E. & S. (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 42. St. Louis, 1856–1860. Evans & Shumard.
Formation: Cretaceous.
Location: Moreau and Grand rivers.

—— **americana** (E. & S.) Meek. (1859.)
Northwest Terr. Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind, p. 184. Toronto, 1859. F. B. Meek.
Formation: Cretaceous.
Location: South branch of the Saskatchewan, Canada.

—— **arenarum** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 292, pl. 5, fig. 8. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.

—— **arenarum** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 48, pl. 5, fig. 8. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

—— **biangulata** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 65. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from its mouth, Nebr.

—— ? **collina** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 157, pl. 13, figs. 3*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between Rio San Pedro and Rio Puercos.

Rostellaria—Continued.

—— **fusiformis** n. s. H. & M. (1854.)

Mem. Am. Acad. Arts and Sci., vol. 5, n. s., p. 393, pl. 3, figs. 10*a*, *b*. Cambridge and Boston, 1855. Hall & Meek.

Formation: Cretaceous.

Location: Sage creek.

—— **macrodactila** n. s. Troost. (1840.)

Fifth Geol. Rep. Tennessee, p. 56. Nashville, 1840. G. Troost.

Formation: Cretaceous.

Location: Near Purdy, McNairy county, Tenn.

—— **monopleurophila** n. s. Roemer. (1888.)

Paleont. Abhandl. Vierter Band. Heft. 4, p. 16, Taf. III [xxxiii], figs. 3*a*, 3*b*. Berlin, 1888. F. Roemer.

Formation: Cretaceous.

Location: Two miles above the mouth of Barton's creek, near Austin, Tex.

—— **pennata** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 48, pl. 19, fig. 9. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Prairie bluff, Ala.

—— **rostrata** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 390, pl. 68, fig. 7. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Burlington county, N. J., and Prairie bluff, Ala.

—— **rostrata** (Mort.) Conrad. (1875.)

Rep. Geol. Sur. N. C., vol. 1, Raleigh, 1875, W. C. Kerr, App. A, pp. 12, 13. T. A. Conrad.

Formation: Cretaceous.

Location: Snow hill, Greene county, N. C.

—— ? **texana** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 158, pl. 13, figs. 4*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Between Rio San Pedro and Rio Puercos [Tex.].

—— **(Rimella) canalifera** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 123, 124, pl. 29, fig. 228. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Martinez, and near Fort Tejon, Cal.

—— **(Rimella) simplex** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 124, pl. 20, fig. 80. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: San Diego; Clayton, Cal.

—— **sp. undet.** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 282. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: Chesapeake and Delaware canal; Mullica hill and other places in New Jersey.

Rostellaria—Continued.

—— **sp. undet.** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 48. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Delaware.

—— **sp. undet.** Roemer. (1849.)

Texas, p. 414. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Fredericksburg, Tex.

—— **sp. undet.** Roemer. (1849.)

Texas, p. 414. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Waterfall near New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide von Tex., p. 38. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Waterfall of the Guadalupe below New Braunfels, Tex.

—— **sp. undet.** Roemer. (1852.)

Kreide von Tex., p. 38. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Fredericksburg, Tex.

Rostellites n. g. Conrad. (1855.)

Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 268. Phila., 1856. T. A. Conrad.

—— (Con.) Dall. (1890.)

Trans. Wag. Free Inst. Sci., Phila., vol. 3, p. 71. Phila., 1890. W. H. Dall.

—— **nasutus** Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 294. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Pataula creek, Clay county, Ga.

—— **texana** Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 158, pl. 14, figs. 2*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Eagle Pass [Tex.].

—— **texana** (Con.) Dall. (1890.)

Trans. Wag. Free Inst. Sci., Phila., vol. 3, pp. 71–73. Phila., 1890. W. H. Dall.

Formation: Cretaceous.

Location: Eagle Pass, Tex.

—— **texanus** n. s. Conrad. (1855.)

Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 268. Phila., 1856. T. A. Conrad.

Formation: Cretaceous.

Location: Eagle Pass, Tex.

Rotalia (Lam.) Reuss. (1861.)

Math.-Naturw. Cl. Kaiserl. Akad. Wiss., Sitzungsb., 1861, Band XLIV, p. 336. Wien., 1862. A. E. Reuss.

—— **calcipara** Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 33. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Mississippi region.

Rotalia—Continued.

—— **globulosa** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 31 and 45. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **globulosa** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 21. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **heptas** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 40. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **lenticulina** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 32. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **leptospira** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 32. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **mortoni** n. s. Reuss. (1861.)
Math.-Narturw. Cl. Kaiserl. Akad. Wiss., Sitzungsb., 1861, Band XLIV, p. 337, Taf. VIII, fig. 1. Wein., 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

—— **nonas** ? Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 36. Liepzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **senaria** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 30. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Rotalina —— Lyell. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, p. 64, figs. *a*, *d*, p. 64. London, 1845. Charles Lyell.
Formation: Cretaceous.
Location: Timber creek, N. J.

Rotundaria (subgen. Raf.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 514. Wash., 1876. F. B. Meek.

Sagrina longirostris Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 22. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Salenia mexicana n. s. Schlüter. (1887.)
Verhandl. Naturlist. Vereines, Preuss, Rheinlande, 44 Jahrg. 1 Hälfte. Bonn, 1887. Sitzungsb., pp. 41, 42.
Formation: Cretaceous.
Location: Gold placers of Guadalupe, seventy-five miles east of Chihuahua, Mexico.

Salenia—Continued.

—— **prestensis** (Desor) Cotteau. (1890.)
Bull. Soc. Geol. France, 3d ser., vol. 18, No. 4, pp. 294, 295. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: Placers de Guadalupe (Chihuahua).

—— **prestensis** (Desor) Cotteau. (1890.)
Bull. Soc. Geol. France, 3d ser., vol. 18, pp. 294, 295. Paris, 1890. Cotteau.
Formation: Cretaceous.
Location: Placers de Gaudalupe (Chihuahua), Mexico.

Sanguinolaria (Lam.) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 277. Phila., 1858–1860. T. A. Conrad.

—— ? **caudata** n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 61, pl. 10, figs. 1–3. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Carbonado, Wash.

—— **cretacensis** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 277, pl. 46, fig. 11. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— **oblata** n. s. Whitfield. (1876.)
Rep. Rec. Carroll Mont to Yellowstone National Park, p. 144, pl. 2, figs. 3, 4. Wash., 1876. R. P. Whitfield.
Formation: Cretaceous.
Location: Near the mouth of the Judith river.

Saxicava [Bellevue] Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 127. St. Petersburg, 1871. E. Eichwald.

—— **jurassica** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont., Black Hills, pp. 25, 26. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater valley, Black hills, Dak.

—— **jurassica** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 376, 377, pl. 5, figs. 25–30. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater valley, Black hills.

—— **ungana** (Grew.) Eichwald. (1871.)
Geog. Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 127. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Unga island, Alaska.

Scala (Klein) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 296. Phila., 1876. W. M. Gabb.

—— **(Opalia) annulata** (Morton) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 298. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

Scala—Continued.

—— (Opalia) cyclostoma n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 297 298. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— (Opalia) thomasi n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 296, 297. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

Scalaria [Lam.] Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, p. 196. Phila., 1827-1831. S. G. Morton.

—— albensis (??) (d'Orb.) Whiteaves. (1876.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 50, 51, pl. 9, fig. 5. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— annulata n. s. Morton. (1830.)
Am. Jour. Sci. 1st ser., vol. 18, pl. 3, fig. 6. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.

—— annulata Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 196, 197. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester county, N. J.

—— annulata Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 47, 48, pl. 3, fig. 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester county, N. J.

—— cerethiformis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci, Phila., for 1856, p. 63. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, Nebr.

—— forsheyi n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 195, 196. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point, Navarro county, Tex.

—— mathewsoni (Gabb) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 45. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sheep Jack island.

—— sillimani n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 47, pl. 13, fig. 9. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

—— sillimani ? (Mort.) Owen. (1860.)
Second Rep. Geol. Rec. Ark., pl. 8, fig. 7. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

Scalaria—Continued.

—— texana Roemer. (1852.)
Kreide von Tex., pp. 39, 40, Taf. 4, figs. 11a, b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe, below New Braunfels, Tex.

—— (Opalia) mathewsonii (Gabb) Whiteaves. (1879.)
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 1 Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— (Scala) bicarinifera n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 1861, 1862, pp. 197, 198. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar county, Tex.

—— (Scala) lamarensis n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 197. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar county, Tex.

—— ? Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, pp. 281, 282. New Haven, 1830. S. G. Morton.
Formation: [Cretaceous].
Location: Gloucester county, N. J.

—— sp. undet. Roemer. (1849.)
Texas, p. 418. Bonn., 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— sp. undet. Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 17. Austin, 188 R. T. Hill.
Formation: Cretaceous ?
Location: North of Webberville, Tex.

Scalpellum (Leach) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 199. Boston, 1862. B. F. Shumard.

—— conradi n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 179, pl. 5, figs. 3, 3*a*, *b*, 4. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Neighborhood of Vincentown, N. J.

—— inæquiplicatum n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 199. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Near Chatfield point, Navarro county, Tex.

Scambula n. g. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 48. Phila., 1870. T. A. Conrad.

Scambula—Continued.

—— **perplana** n. s. Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 48, pl. 9, figs. 7, 8. Phila., 1870. T. A. Conrad.

Formation: Cretaceous.

Location: Haddonfield, N. J.

—— **perplana** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 123, 124, pl. 18, figs. 8–10. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

Scaphites (Park.) Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 109. Phila., 1827–1831. S. G. Morton.

—— **abyssinus** (Morton sp.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 51. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: White Mud river, about twenty miles west of the crossing of Wood mountains and Cypress hills trails, Canada.

—— **conradi** (Morton sp.) Meek. (1859.)

Northwest Terr., Rep. Prog. Assin. and Saskat. Expl. Exped., H. Y. Hind., p. 185 Toronto, 1859. F. B. Meek.

Formation: Cretaceous.

Location: South branch of the Saskatchewan, Canada.

—— **conradi** (Morton) Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 429. Phila., 1871. F. B. Meek.

Formation: Cretaceous.

Location: Fountain creek, Colorado city, Colo.

—— **cuvieri** n. s. Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st. ser., 1827–1831, pp. 109–115, pl. 7, fig. 1. Phila., 1827–1831. S. G. Morton.

Formation: Cretaceous.

Location; Deep cut of the Chesapeake and Delaware canal.

—— **cuvieri** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, pp. 280, 281. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: [Deep cut of the Chesapeake and Delaware canal?]

—— **hippocrepis** (DeKay sp.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 41, 42, pl. 7, fig. 1. Phila., 1834. S. G. Morgan.

Formation: Cretaceous.

Location: Deep cut of the Chesapeake and Delaware canal.

—— **iris** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 335, pl. 35, fig. 23. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

Scaphites—Continued.

—— **larvæformis** n. s. M. & H. (1858.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 58. Phila., 1859. Meek & Hayden.

Formation: Cretaceous.

Location: East base of the Black hills.

—— **larvæformis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 418, 419, pl. 6, figs. 6*a*–*c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Eastern base of the Black hills.

—— **mandanensis** (Morton sp.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Bear and Ralston creeks, Colo.

—— **nicolleti** (Morton sp.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 51, 52. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Creek twelve miles east of White Mud river (or Frenchman's creek), Old Wives creek, township 10, range 11, west of third principal meridian, Canada.

—— **nodosus** (Owen) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 186. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Fossil ridge, Colo.

—— **nodosus** (Owen) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 197. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Bear creek, near Morrison, Colo.

—— **nodosus** (Owen) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 206, 207. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Sage creek, Colo.

—— **nodosus** (Owen) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp, 441–443, pl. 13, fig. 12. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near Rapid creek, Black hills, Dak.

—— **nodosus** (Owen) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Poleont., vol. 1, pt. 1, p. 52. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: South branch of the Saskatchewan; elbow of the South Saskatchewan; South Saskatchewan, mouth of Swift Current creek; west end of the Cypress hills, Canada.

—— **nodosus** (Owen) Stanton. (1887.)

Proc. Colo. Sci. Soc., vol. 2, pt. 3, for 1887, p. 187. [Denver, 1888.] T. W. Stanton.

Formation: Cretaceous.

Location: About five miles north of the town of Boulder, Colo.

Scaphites—Continued.

—— **nodosus** (Owen) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 182. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: North Saskatchewan river, near the mouth of Moose Hill creek, Northwest Territory.

—— **nodosus** var. **brevis** n. var. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 426–428, pl. 25, figs. 1*a–c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Yellowstone river, Mont., one hundred and fifty miles above its mouth.

—— **nodosus** var. **brevis** (Meek) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 443, pl. 13, figs. 8, 9. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: Cheyenne river, near Rapid creek, Black hills, Dak.

—— **nodosus** var. **plenus** n. var. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, pp. 177, 178. Phila., 1861. Meek & Hayden.

Formation: Cretaceous.

Location: Yellowstone river, one hundred and fifty miles above the mouth, Nebr.

—— **nodosus** var. **plenus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 429, 430, pl. 26, figs. 1*a–c*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Yellowstone river, one hundred and fifty miles from its mouth.

—— **nodosus** var. **quadrangularis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 428, 429, pl. 25, figs. 3*a–c*; 2*a–e*, and fig. 4. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Yellowstone river, Mont., one hundred and fifty miles above its mouth.

—— **nodosus** var. **quadrangularis** (Meek) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 443, 444, pl 13, figs. 10, 11. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Cheyenne river, near Rapid and French creeks, and also from Old Woman fork, Black hills.

—— **nodosus** ? var. Meek. (1859.)

N. W. Terr., Rep. Prog. Assin and Saskat. Expl. Exped., H. Y. Hind, p. 185, pl. 2, figs. 7, 8. Toronto, 1859. F. B. Meek.

Formation: Cretaceous.

Location: South branch of the Saskatchewan, Canada.

Scaphites—Continued.

—— **quatsinoensis** Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser. 1886, App. I, p. 114 B. Montreal, 1887. J. F. Whiteaves.

Formation: Cretaceous.

Location: East side of Winter harbor, Forward inlet, Quatsino sound, Vancouver island.

—— **quatsinoensis** Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 158, 159, pl. 21, fig 2. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: East side of Winter harbor, Forward inlet, Quatsino sound, Vancouver island.

—— **reniformis** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 291. New Haven, 1833. S. G. Morton.

Formation: Cretaceous.

Location: United States.

—— **reniformis** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 42, pl. 2, fig 6. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: Near Bordentown, N. J.

—— **semicostatus** n. s. Roemer. (1852.)

Kreide von Tex., p. 35, Taf. 1, fig. 5, *a*, *b*. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Ford of Guadalupe, New Braunfels, Tex.

—— **subglobosus** n. s. Whiteaves. (1885.

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol, 1, pt. 1, pp. 52, 53, pl. 7, fig. 3, and pl. 8. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: East branch of the Poplar river on the forty-ninth parallel, Old Wives creek, township 10, range 11, west of third principal meridian, Canada.

—— **texanus** n. s. Roemer. (1852.)

Kreide von Tex., p. 35, Taf. 1, figs. 4*a–c*. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Ford of the Guadalupe, New Braunfels, Tex.

—— **ventricosus** n. s. H. & M. (1862.)

Proc. Acad. Nat. Sci., Phila., for 1862, p. 22. Phila., 1863. Meek & Hayden.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Upper Missouri.

—— **ventricosus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 425, 426, pl. 6, figs. 7*a*, *b*, 8*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Upper Missouri.

Scaphites—Continued.

—— **vermiculus** n. s. Shumard. (1859.)

Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 594, 595. St. Louis, 1856–1860. B. F. Shumard.

Formation: Cretaceous.

Location: Grayson county, about four miles north of Sherman, Tex.

—— **vermiculus** (Shumard) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 39, pl. 18, fig. 8*a*. Wash., 1883. C. A. White.

—— **vermiformis** n. s. M. & H. (1862.)

Proc. Acad. Nat. Sci., Phila., for 1862, pp. 22, 23. Phila., 1863. Meek & Hayden.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Upper Missouri.

—— **vermiformis** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 423–425, pl. 6, figs. 4*a*, *b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Chippewa point, near Fort Benton, on the Upper Missouri.

—— **vermiformis** ? (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 86. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest branch of north fork of the Old Man river; entrance to the North Kootanie pass, Canada.

—— **verrucosus** n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 189, 190. Boston, 1862. B. F. Shumard.

Formation: Cretaceous.

Location: Near Dresden, Navarro county, Tex.

—— **warreni** n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 177. Phila., 1861. Meek & Hayden.

Formation: Cretaceous.

Location: Near the Black hills, Nebr.

—— **warreni** (M. & H.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 200, 201, pl. 19, fig. 3*a*. Wash., 1875. C. A. White.

Formation: Cretaceous.

Location: Three miles southwest of San Mateo, N. Mex.

—— **warreni** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 420–423, pl. 6, fig. 5, figs. 61–63, p. 421. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Medicine Bow river, and east of Fort Steele, Wyo.

—— **warreni** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 444–446, pl. 13, figs. 1–4. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: Outer edge of Camp Jenney, east fork of Beaver creek, Black hills, Wyo.

Scaphites—Continued.

—— **warreni** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 86. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Highwood river, ten miles west of first fork; entrance to Kootanie pass; northwest branch of north fork of the Old Man river, about four miles below Oyster creek, Canada.

—— **warreni** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 82. Montreal, 1885. J. F. Whiteaves.

Formation : Cretaceous.

Location: West flank of West Butte, Montana, near the forty-ninth parallel; Rocky Spring ridge, near MacLeod, Benton trail, Canada.

—— **wyomingensis** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 446, 447, pl. 13, figs. 5–7. Wash., 1880. R. P. Whitfield.

Formation: Cretaceous.

Location: On the Belle Fourche, and on the east fork of Beaver creek, Black hills.

—— (**Ammonites ?**) **nodosus** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., p. 581, pl. 8, fig. 4. Phila., 1852. D. D. Owen.

Formation: Cretaceous.

Location: Sage creek, a southern tributary of the Cheyenne.

—— (**Ammonites ?**) **comprimus** n. s. Owen. (1852.)

Rep. Geol. Sur. Wis., Iowa, Minn., p. 580, pl. 8, fig. 4. Phila., 1852. D. D. Owen.

Formation: Cretaceous.

Location: Fox hills, Nebr.

—— (**Discoscaphites**) **abyssinus** (Mort. sp.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 441–443, pl. 35, figs. 2*a*, *b*, and 4. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river, Dak.

—— (**Discoscaphites**) **cheyennensis** (Owen sp.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 437–441, pl. 35, figs. 3*a*–*i*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Fox hills, Moreau and Cheyenne rivers, Dak.

—— (**Discoscaphites**) **conradi** (Mort. sp.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 430–432, pl. 36, figs. 2*a*–*e*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Fox hills, Long lake, Moreau river, and near the eastern base of the Black hills, Dak.

Scaphites—Continued.

—— (**Discoscaphites**) **conradi** var. **gulosus** (Mort.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 432, 433, pl. 36, fig. 1. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fox hills, Long lake, Moreau river, etc.

—— (**Discoscaphites**) **conradi** var. **intermedius** n. var. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 433–435, pl. 34, figs. 3a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Dak.

—— (**Discoscaphites**) **mandanensis** (Mort. sp.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 443, 444, pl. 35, figs. 1a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river, Dak.

—— (**Discoscaphites**) **nicolletii** (Mort. sp.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 435, 436, pl. 34, figs. 4a–c, 2a, b. Wash., 1876. F. B. Meek.
Formation : Cretaceous.
Location : Moreau river, Fox hills, Long lake, etc., Dak., and Yellowstone river, Mont.

—— **sp. undet.** Roemer. (1849.)

Texas, pp. 415, 416, Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Tex.

—— **sp. undet.** Roemer. (1849.)

Texas, p. 416. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Ford near New Braunfels, Tex.

Schizodesma (Gray) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 306. Phila., 1876. W. M. Gabb.

——(subgen. Gray) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 204. Wash., 1876. F. B. Meek.

—— ? **appressa** n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, pp. 306, 307. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Schloenbachia borealis n. s. ? Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 160–162, pl. 21, fig. 5. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rink rapids, on the Lewis river, a tributary of the Yukon, latitude 60° 20′, longitude 136° 30′, Northwest Territory.

—— **borealis** Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 170. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

Schloenbachia—Continued.

—— **gracilis** n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 171, pl. 23, figs. 2, 2a. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— **inflata** (Sow. sp.) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 200. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bear Skin bay, Skidegate inlet.

—— **propinqua** n. s. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 247, 248, pl. 33, figs. 2, 2a–c. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island; east side of South bay, in Skidegate inlet.

Scobinella (Conrad) White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 25. Wash., 1889. C. A. White.

—— **dilleri** n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, pp. 25, 26, pl. 4, figs. 1–3. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Little Cow creek valley eighteen miles east of Redding, Shasta county, Cal., also Curry's Canada, south of Mount Diablo, Cal.

Sconsia (Gray) Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 301, pl. 48, fig. 13. Phila., 1858–1860. W. M. Gabb.

—— (subgen. Gray) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 104. Phila., 1864. W. M. Gabb.

—— **alabamensis** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 301, pl. 48, fig. 13. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

Scutella (Lam.) Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 77. Phila., 1834. S. G. Morton.

—— **caroliniana** n. s. Ravenel. (1841.)

Proc. Acad. Nat. Sci., Phila., vol. 1, 1841–1843, p. 81. Phila., 1843. E. Ravenel.
Formation: Cretaceous [Tertiary].
Location: Cooper river, in St. Thomas parish, about seventeen miles from Charleston [S. C.].

—— **crustuloides** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 131, pl. 10, fig. 3. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Southern States.

—— **crustuloides** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 77, pl. 15, fig. 10. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina.

Scutella—Continued.

—— **lyelli** (Conrad) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 77, pl. 10, fig. 8. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].

—— **macrophora** n. s. Ravenel. (1841.)
Proc. Acad. Nat. Sci., Phila., vol. 1, 1841-1843, pp. 81, 82. Phila., 1843. E. Ravenel.
Formation: Cretaceous [Tertiary].
Location: Cooper river, in St. Thomas parish, about seventeen miles from Charleston, [S. C.].

—— **rogersi** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 77, pl. 13, fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: Monroe county, Ala.

—— **rogersi** (Mort.) Agas. (1838.)
Mong. d'Echinodermes Vivans et Fossiles, pp. 83, 84, pl. 19a, figs. 1-4. Neuchatel, 1838. L. Agassiz.
Formation: Cretaceous [Tertiary].
Location: Alabama.

Seila (subgen. A. Adams) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 335. Wash., 1876. F. B. Meek.

Sepia [Linn.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 32. Phila., 1834. S. G. Morton.
Formation: Cretaceous.

Septifer (Recluz) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1 p. 186. Phila., 1864. W. M. Gabb.

—— **dichotomus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 186, pl. 30, fig. 261. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Cal.

Septocardia n. g. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 294, 295, Wash., 1877. Hall & Whitfield.

—— **carditoidea** n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 296, 297, pl. 7, fig. 25. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Shoshone springs, Augusta mountains, Nev.

—— **typica** n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 295, 296, pl. 7, figs. 26-29. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Shoshone springs, Augusta mountains, Nev.

Serpula [Linn.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 73, Phila., 1834. S. G. Morton.

—— **barbata** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 73, pl. 15, fig. 12. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Alabama.

Serpula—Continued.

—— **habrogramma** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 398, pl. 68, fig. 16. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Long Branch, N. J.

—— **intrica** n. s. White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundreth meridian, vol, 4, pt. 1, p. 205, pl. 15, fig. 5a. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

—— **semicoalita** n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 185, pl. 26, fig. 1. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Vermilion river, township 25, range 20 W.; Swan river, township 35, range 29 W., Manitoba.

—— ? **tenuicarinata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 507, 508, pl. 6, fig. 1. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Vermilion river, Dak., on the Missouri.

—— ? **tenuicarinatus** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 134. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Vermilion river, on the Missouri, Nebr.

—— **triangularis** (Munst.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 240. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

—— **rotula** (Mort. sp.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, p. 241. Berlin, 1870. H. Credner.
Formatian: Cretaceous.
Location: Timber creek, N. J.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 282. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: Two miles west of Long Branch.

—— **sp. undet.** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 73. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Near Deal, N. J.

—— **sp. undet.** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 128, pl. 5, fig. 4. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

Serpula—Continued.

—— ? Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 276, pl. 36, fig. 11. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— —— ? Whiteaves. (1878.)

Canadian Naturalist, vol. 8, n. ser., No. 7, p. 408. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— ? Whiteaves. (1878.)

Geol. Sur. Can., Rep. Prog. for 1876, 1877, pp. 157, 158. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

—— sp. undet. Urquiza. (1882.)

An. Min. Fomento Rep. Mex., Tomo 7, p. 225, fig. 19. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Road to Rincon, Coalcoman district, State of Michoacan, Mexico.

—— sp. undet. Hill. (1888.)

Ann. Rep. Geol. Sur. Ark. for 1888, vol. 2, p. 135. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous ?
Location: Arkansas.

Serrifusus subgen. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 373. Wash., 1876. F. B. Meek.

—— dakotensis var. vancouverensis n. var. Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 119, 120, pl. 15, fig. 5. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island.

Siliqua (Mühlf.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 147. Phila., 1864. W. M. Gabb.

—— cretacea (Gabb) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 186, 187, pl. 25, figs. 9, 10. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— oregonensis n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 147, pl. 29, fig. 237. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North side of the Siskiyou mountains, Oregon, near the toll house on the stage road.

Siliquaria (Schum.) Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 324. Phila., 1855–1858. T. A. Conrad.

—— biplicata n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, pp. 324, 325, pl. 34, fig. 17. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Sincyclonema ? (Meek) Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 99. Phila., 1870. T. A. Conrad.

—— simplicius (Con.) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 319. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

Sinistralia (subgen. H. & A. Ad.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 373. Wash., 1876. F. B. Meek.

Smilotrochus (E. & H.) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 205. Phila., 1869. W. M. Gabb.

—— ? curtus n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 205, pl. 34, figs. 106, 106a. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

—— (?) vancouverensis n. s. Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 178, pl. 20, figs. 7, 7a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Southwest side of Hornby island.

Solarium (Lam.) Gabb. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 94. Phila., 1861. W. M. Gabb.

—— abysinus n. s. Gabb. (1860.)

Proc. Acad. Nat. Sci. Phila. for 1860, p. 94, pl. 2, fig. 9. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— conoideum (Fitt.) Eichwald. (1871.)

Geogr.-Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 156. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

—— planorbis n. s. Roemer. (1888).

Paleont. Abhandl. Vierter Band, Heft 4, pp. 15, 16, Taf. I [XXXI], figs. 14a–14c. Berlin, 1888. F. Rõemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Barton creek, near Austin, Tex.

—— wallense n. s. White. (1885.)

Bull. U. S. Geol. Sur., No. 22, p. 14, pl. 5, figs. 1, 2. Wash., 1885. C. A. White.
Formation: Cretaceous.
Location: Near the town of Wallala, Mendocino county, Cal.

Solecurtus (Tagelus) occidentalis Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 178, 179, pl. 24, fig. 4. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Battle river, township 40, range 13, west of the fourth principal meridian, Northwest Territory.

Solemya [Lam.] Conrad. (1850.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 274. Phila., 1850–1854. T. A. Conrad.

—— **bilix** n. s. White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, p. 158. Wash., 1880. Smithson. Misc., Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous.
Location: About four miles north of Golden, Colo.

—— **bilix** White. (1881.)
Proc. U. S. Nat. Mus., vol. 4, p. 139, pl. 1, fig. 9. Wash., 1881. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

—— **planulata** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci. Phila., vol. 2, 2d ser., 1850–1854, p. 274, pl. 24, fig. 11. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Monmouth county, N. J.; Alabama.

—— **subplicata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 129, pl. 28, fig. 19. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— **triasina** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 102. Phila., 1870. T. A. Conrad.
Formation: Triassic.
Location: Near Perkiomen creek, Pa.

Solen (Linn.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 146. Phila., 1864. W. M. Gabb.

—— ? **dakotensis** n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 142. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Just below the mouth of Vermilion river, Nebr.

—— **irradians** n. s. Roemer. (1852.)
Kreide von Tex., p. 45, Taf. 6, figs. 9a, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **parallelus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 146, 147, pl. 22, fig. 117. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Bull head point, near Martinez; Marsh, east of Mount Diablo; Alizos creek, near Fort Tejon, Cal.

—— **subplicatus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 82. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— (**Hypogella**) **cuneatus** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 175, 176, pl. 29, fig. 61. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Solen—Continued.

—— (**Hypogella**) **diegoensis** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 176. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.

—— ? **sp. undet.** Roemer. (1849.)
Texas, p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

Solena (Browne) Con. (1865.)
Proc. Acad. Nat. Sci., Phila., for 1865, p. 184. Phila., 1865. T. A. Conrad.

—— **biplicata** Con. (1865.)
Proc. Acad. Nat. Sci., Phila., for 1865, p. 184. Phila., 1865. T. A. Conrad.
Formation: Cretaceous.

Solenoceras n. g. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 284. Phila., 1858–1860. T. A. Conrad.

—— **annulifer** (Mort. sp.) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 284. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

Solidula (Fischer) Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 194. Boston, 1862. B. F. Shumard.

—— **riddelli** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 194. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Navarro county, Tex.

Solidulus (Fischer) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 334. Phila., 1855–1858. T. A. Conrad.

—— **linteus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 334, pl. 35, fig. 10. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Solyma n. g. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 75. Phila., 1871. T. A. Conrad.

—— **lineolata** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 182, 183, pl. 25, figs. 11–13 Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **lineolatus** n. s. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, pp. 75, 76, pl. 3, fig. 9. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **lineolatus** (Con.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 305. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Spatangus (Lam.) Morton. (1824.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 122, 123. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

—— cor marinum ? (Park.) Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, p. 199. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester county, N. J.

—— cor marinum ? (Park.) Morton. (1830.)
Am. Jour. 1st ser., vol. 18, pl. 3, fig. 10. New Haven, 1830. S. G. Morton.

—— parastatus n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 294. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— parastatus Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 77, 78, pl. 3, fig. 21. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Ala.; Timber creek, N. J.

—— stella n. s. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, p. 245, pl. 3, fig. 11. New Haven. 1830. S. G. Morton.
Formation: Cretaceous.

—— stella Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, p. 200. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.

—— ungula n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 24, p. 131, pl. 10, fig. 9. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: Deep cut of the Chesapeake and Delaware canal.

—— ungula Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 78, pl. 10, fig. 6. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Chesapeake and Delaware canal.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: Gloucester county, N. J.

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: Deep cut of the Chesapeake and Delaware canal.

Sphæra (Sow.) Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 102. Wash., 1877. F. B. Meek.

Sphæra—Continued.

—— whitneyi n. s. Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 102, pl. 10, figs. 4a-c. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Buena Vista canyon, West Humboldt range, Nev.

Sphærella n. g. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 280. Phila., 1858-1860. T. A. Conrad.

—— concentrica n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 280, pl. 46, fig. 4. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula [Ala.].

Sphæriola (Stoliczka) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 136, 137. Wash., 1876. F. B. Meek.

—— ? cordata (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 137, 138, pl. 29, figs. 3a-c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

—— ? endotrachys n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 139, pl. 29, fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Ninety miles below Fort Benton, on the Missouri.

—— ? endotrachys (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 182. Wash., 1871. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek, Colo.

—— ? obliqua n. s. Meek. (1875.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 1, No. 1, 2d ser., p. 46. Wash., 1875. F. B. Meek.
Formation: Cretaceous.
Location: Left-hand creek, halfway between Long Mont and Boulder city, Colo.

—— ? obliqua (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 182. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valley of Little Thompson creek, Colo.

—— transversa n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, pp. 34, 35. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Old Woman's fork., Dak.

—— transversa Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 146, pl. 10, figs. 14-16. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Old Woman's fork, Wyo.

Sphæriola—Continued.

—— **umbonata** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 152, pl. 19, figs. 17, 18. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

—— ? **warrenana** n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 138, 139. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near the eastern base of the Black hills.

Sphærium (Scopoli) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, pp. 32, 33. Wash., 1865. T. Prime.

—— **formosum** (M. &. H.) Prime. (1865.)
Mon. Am. Corbiculadae (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, p. 59. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Three miles above Fort Union, Nebr.

—— **formosum** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 526, 527, pl. 43, figs. 4a–c. Wash., 1876. F. B. Meek.
Formation: Lower Eocene? [Cretaceous].
Location: Ten miles below Fort Union.

—— **formosum** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 72. Wash., 1883. C. A. White.
Formation: [Cretaceous.]
Location: Upper Missouri river region.

—— **formosum** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 33, pl. 17, fig. 11. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **formosum** ? (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 68. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, east side of Driftwood bend, South Saskatchewan, one mile below the mouth of the Bow river, Canada.

—— **formosum** ? (M. & H.) var. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 61, 62, pl. 9, fig. 3. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Ed. Mahan's coulee; Belly river, eight miles above Coal banks, Canada.

—— **planum** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 175, 176. Phila., 1861. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Near the mouth of Grand river, on the Upper Missouri, Nebr.

Sphærium—Continued.

—— **planum** (M. & H.) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, p. 58. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Near the mouth of Grand river, on the Upper Missouri, Nebr.

—— **planum** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 526, pl. 43, figs. 6a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Grand island, on the upper Missouri.

—— **planum** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 72. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **planum** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 33, pl. 17, fig. 8. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **recticardinale** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 176. Phila., 1861. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Near the mouth of Grand river, on the Upper Missouri, Nebr.

—— **recticardinale** (M. & H.) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, p. 58. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Near the mouth of Grand river, on the Upper Missouri, Nebr.

—— **recticardinale** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 527, 528, pl. 43, figs. 3a, b. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Grand island, on the Upper Missouri.

—— **recticardinale** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1., p. 72. Wash., 1883. C A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **recticardinale** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 33, pl. 17, fig. 9. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Sphærium—Continued.

——**recticardinale** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 9. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Old Man river, two miles above Rye-Grass flat, Canada.

—— **subellipticum** (M. & H.) Prime. (1865.)
Mon. Am. Corbiculadæ (Recent and Fossil), Smithson. Misc. Coll., vol. 7, No. 145, p. 59. Wash., 1865. T. Prime.
Formation: Tertiary [Cretaceous].
Location: Three miles above Fort Union, Nebr.

—— **subellipticum** (M. & H) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 527, pl. 43, figs. 5*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Lower Eocene? [Cretaceous].
Location: Ten miles below Fort Union, Nebr.

—— **subellipticum** (M. & H.) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 72. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **subellipticum** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 33, pl. 17, fig. 10. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Misiouri river region.

—— —— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Ter., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Evanston coal mines, Wyo.

Sphenodiscus subgen. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 463. Wash., 1876. F. B. Meek.

—— **mandensis** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 200, 201, pl. 22, figs. 3, 3*a*, *b*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East point of Maud island, in Skidegate inlet.

—— **requienianus** ? (d'Orb.) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 248, pl. 22, figs. 4, 4*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Maud island.

Spirifer (Sow.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 35. Phila., 1864. W. M. Gabb.

Spirifer—Continued.

—— **homfrayi** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 35, pl. 6, fig. 38. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Star canyon, Humboldt county, Nev.

—— **obtusus** n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 17, 18, pl. 7, figs. 16, *a*, *b*. Phila., 1870. W. M. Gabb.
Formation: Triassic.
Location: Volcano, about thirty miles southeast of Walker's lake, Nev.

Spirifera (**Spiriferina** ?) **alia** n. s. H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 281, 282, pl. 6, fig. 17. Wash., 1877. Hall & Whitfield.
Formation: Triassic.
Location: One and a half miles south of Dun Glen pass, Pah-Ute range, Nev.

Spiriferina (d'Orb.) H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 281. Wash., 1877. Hall & Whitfield.

—— **borealis** n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 128, 129, pl. 17, fig. 1. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about twenty-five miles below Devil's portage, Canada.

—— **homfrayi** ? (Gabb) H. & W. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 281, pl. 6, fig. 18. Wash., 1877. Hall & Whitfield.
Formation: Triassic.
Location: One and a half miles south of Dun Glen pass, Pah-Ute range, Nev.

Spiroceras (Meek) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 198. Montreal, 1884. J. F. Whiteaves.

—— **carlottense** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 198, 199. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: North shore of Cumshewa inlet.

Spirocrypta n. subgen. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 136, 137. Phila., 1864. W. M. Gabb.

Spironema n. g. Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 35. Wash., 1864. F. B. Meek.

——**tenuilineata** (M. & H.) Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 35. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Dakota.

Spironema—Continued.

—— **tenuilineata** (M. & H. sp.) Meek. (1876).
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 342, 343, pl. 32, fig. 9, a-c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

Spiroplecta americana Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 25. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **americana** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 13, 14. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **rosula** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 26. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Spiropora (d'Orb.) G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 166. Phila., 1862, 1863. Gabb & Horn.

—— **calamus** n. s. G. & H. (1862.)
Jour. Acad. Nat. Sci., Phila., vol. 5, 2d ser., 1862, 1863, p. 166 [pl. 21], fig. 55. Phila., 1862, 1863. Gabb & Horn.
Formation: Cretaceous.
Location: Timber creek, N. J.

Spirorbis (Lamarck) White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, p. 161. Wash., 1880. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

—— ? **dickhauti** n. s. White. (1880.)
Proc. U. S. Nat. Mus., vol. 3, p. 161. Wash., 1880. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.
Formation: Cretaceous [Tertiary].
Location: Near Little Rock, Ark.

—— ? (Lam.) Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 121, 122. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

—— ? Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 282. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— ? White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 246. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Near Mellis station, Wyo.

Spondylus [Lam.] Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 274. Phila., 1850–1854. T. A. Conrad.

—— **capax** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 274, pl. 24, fig. 8. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Nimrod Woodward's farm N. J.

—— **gregalis** (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 57, 58, pl. 9, figs. 11, 12, pl. 10, figs. 1, 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Upper Freehold, Monmouth county, N. J.

—— **guadalupæ** n. s. Roemer. (1849.)
Texas, p. 400. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waterfall near New Braunfels, Tex.

—— **guadalupæ** Roemer. (1852.)
Kreide von Tex., pp. 62, 63, Taf. 8, figs. 9a, b. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waterfall of the Guadalupe and crossing of the Cibolo between New Braunfels and San Antonio, Tex.

—— n. s. ? Hill. (1889.)
Geol. Sur. Tex., Bull. No. 4, p. 7. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Two miles northwest of Austin, Tex.

Stalagmium n. subgen. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 281. Phila., 1858–1860. T. A. Conrad.

Stavella (subgen. Gray) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 68. Wash., 1876. F. B. Meek.

Stearnsia n. g. White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, pp. 32, 33. Phila., 1887. C. A. White.

—— **robinsi** n. s. White. (1887.)
Proc. Acad. Nat. Sci., Phila., pt. 1, for 1887, pp. 33, 34, pl. 2, figs. 7-9. Phila., 1887. C. A. White.
Formation: Cretaceous.
Location: Texas [Six miles north of Fort Worth].

Stephanoceras braikenridgii (?) (Sow. sp.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 407. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— **braikenridgii** (?) (Sow. sp.) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–1877, p. 156. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

Stephanoceras—Continued.

—— **cephoides** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 210. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South island, Skidegate inlet.

—— **humphreysianum** (Sow. sp.) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 407. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake.

—— **humphreysianum** (Sow. sp.) Whiteaves. (1878.
Geol. Sur. Can., Rep. Prog. for 1876-1877, p. 156. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake, British Columbia.

—— **oblatum** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 209, 210. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skidegate inlet, Queen Charlotte islands.

—— —— (?) Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 407. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river.

—— —— (?) Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876, 1877, pp. 156, 157. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river, British Columbia.

Stomatia (Lamarck) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 18. Wash., 1889. C. A. White.

—— **obstricta** n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 18, 19, pl. 4, figs. 10, 11. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Little Cow creek, Shasta county, Cal.

—— **suciensis** n. s. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 128, 129, pl. 16, fig. 4. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— **suciensis** var. **carinifera** n. var. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 128, 129, pl. 16, fig. 5. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

Straparollus (Montf.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 120. Phila., 1864. W. M. Gabb.

Straparollus—Continued.

—— **lens** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 120, 121, pl. 20, figs. 77a-d. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **paucivolvus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 120, pl. 20, fig. 76. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

Straparolus (Mortf.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 299. Phila., 1858, 1860. W. M. Gabb.

—— **lapidosus** (Mort. sp.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 300, pl. 48, fig. 5a, b. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.

—— **subplanus** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, pp. 299, 300, pl. 48, figs. 4, a, b. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

Strepsidura (Swains.) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 286. Phila., 1858-1860. T. A. Conrad.

—— **ripleyana** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 286, pl. 46, fig. 42. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

Striarca (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 78. Wash., 1876. F. B. Meek.

Strombus (Linn.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 330. Phila., 1855-1858. T. A. Conrad.

—— **densatus** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 330, pl. 35, fig. 14. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Strophoconus spicula ? Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 21. Leipsig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Surcula (H. & A. Ad.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 150. Phila., 1869. W. M. Gabb.

—— (subgen. H. & A. Ad.) (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 381. Wash., 1876. F. B. Meek.

Surcula—Continued.

—— præattenuata n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 150, pl. 26, fig. 27. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: San Diego, Cal.

—— raricostata (Gabb.) var. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 116, 117, pl. 15, figs. 2, 2a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: West side of Hornby island, Nanaimo river, Vancouver island.

—— strigosa n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 299, 280. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Holmdale, N. J.

—— suciensis n. s. Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss, vol. 1, pt. 2, pp. 115, 116, pl. 15, figs. 1, 1a. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Sucia islands.

—— (Surculites) [io] Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 280. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: [California.]

—— (Surculites) inconspicua n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 151, pl. 26, fig. 29. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— (Surculites) mathewsonii (Gabb sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 280. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: [California.]

—— (Surculites) sinuata Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 150, 151 pl. 26, fig. 28. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Tejon; Canada de lás Uvas and Arroyo de los Alizos, Cal.

Surculites (subgen. Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 382. Wash., 1876. F. B. Meek.

Sycodes n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 160. Phila., 1889. W. M. Gabb.

—— cypræoides Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 160. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: California.

Sycodes—Continued.

—— (?) cypræoides ? (Gabb.) Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two and one-half and two and one-quarter miles up.

—— (?) cypræoides (?) (Gabb). Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 263. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island.

—— glaber (Shum. sp.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 125. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Protection island; Nanaimo river, two miles and a quarter up, Vancouver island, Sucia islands.

Syncyclonema n. g. Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 31. Wash., 1864. F. B. Meek.

—— meekana Whiteaves. (1882.)
Proc. and Trans. Roy. Soc. Can., vol. 1, sec. 4, p. 86. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Jackass mountain, also between Fountain and Lilloet, and near the thirty-sixth mile post on the wagon road to Yale. All localities on the Lower Fraser river, Canada.

—— meekiana n. s. Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 82, 83, fig. 9, p. 82. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— rigida (H. & M.) Meek. (1864.)
Check List Invert. Foss. N. Am., Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 31. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Dakota.

—— rigida (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Ter., vol. 9, pp. 27, 28, pl. 16, figs. 5, *a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Sage creek, Fox hills, and Moreau river.

—— rigida (H. & M.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 383, 384, pl. 7, fig. 1. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: At the forks of the Cheyenne river, Black hills.

—— simplicia n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 99, pl. 9, fig. 20. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

Tancredia (Lycett) M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 95, 96. Wash., 1865. Meek & Hayden.

—— ? æquilateralis n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 183. Phila., 1861. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of Black hills, Nebr.

—— ? æquilateralis M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 96, 97, pl. 3, fig. 8. Wash., 1865. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— americana (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 142–144, pl. 38, figs. 1a–h. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Judith river, on the Upper Missouri, Cache la Poudre, in Colorado.

—— americana (M. & H.) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 182. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Valley of Cache la Poudre, and at mouth of St. Vrain creek, Colo.

—— americana (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 39. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Berry creek, section 31, township 25, range 12, west of the fourth principal meridian, Canada.

—— americana (M. & H.) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 175. Montreal, 1889. J. F. Whiteaves.

Formation: Cretaceous.

Location: Sounding creek, township 30, range 8, west of the fourth principal meridian, Northwest Territory.

—— bulbosa n. s. Whitfield. (1877.)

U. S. Geogr. and Geol. Sur. Rocky Mt. Region Prelim. Rep. Paleont., Black Hills, p. 22. Wash., 1877. R. P. Whitfield.

Formation: Jurassic.

Location: East of Belle Fourche, Black hills, Dak.

—— bulbosa Whitfield. (1880).

Rep. Geol. Black Hills of Dak., pp. 370, 371, pl. 6, figs. 1–3. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: East of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— ? cœlionotus White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 182. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: The Cache la Poudre, ten miles west of Greeley, Colo.

Tancredia—Continued.

—— ? cœlionotus n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 288, pl. 5, figs. 2a–d. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Ten miles west of Greeley, Colo.

—— corbuliformis n. s. Whitfield. (1877).

U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont., Black Hills, pp. 21, 22. Wash., 1877. R. P. Whitfield.

Formation: Jurassic.

Location: East of Belle Fourche, Black hills, Dak.

—— corbuliformis Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 370, pl. 6, figs. 5–8. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: East of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— extensa n. s. White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 150, pl. 38, fig. 4a. Wash., 1883. C. A. White.

Formation: Jurassic.

Location: North side of Bull lake fork, Southeastern Idaho.

—— ? inornata (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 368, 369, pl. 6, figs. 9–13. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: East of the Belle Fourche river, near Bear Lodge butte, Black hills.

—— postica n. s. Whitfield. (1877.)

U. S. Geogr. and Geol. Sur. Rocky Mt. Region: Prelim. Rep. Paleont., Black Hills, pp. 22, 23. Wash., 1877. R. P. Whitfield.

Formation: Jurassic.

Location: East of Belle Fourche, Black hills of Dakota.

—— postica Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 371, 372, pl. 6, fig. 14. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: East of the Belle Fourche river, Black hills.

—— warrenana n. s. M. & H. (1860.)

Proc. Acad. Nat. Sci., Phila., for 1860, p. 183. Phila., 1861. Meek & Hayden.

Formation: Jurassic.

Location; Southwest base of Black hills, Nebr.

—— warrenana M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 96, pl. 3, fig. 7. Wash., 1865. Meek & Hayden.

Formation: Jurassic.

Location: Southwest base of the Black hills.

—— warrenana (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., p. 372, pl. 6, fig. 4. Wash., 1880. R. P. Whitfield.

Formation: Jurassic.

Location: Red water valley, southeast of Warren peaks, Black hills.

Tapes [Megerle] Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 601. St. Louis, 1856–1860. B. F. Shumard.

—— conradiana n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 169, pl. 32, fig. 282. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon, Cal.

—— hilgardi n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 601. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar, and Fannin counties, Tex.

—— hilgardi (Shum.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 265, 266, pl. 36, fig. 13. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— hilgardi (Shumard) White. (1883.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 22, pl. 16, figs. 3*a*–*c*. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Bluffs of Red river, Lamar, and Fannin counties, Tex.

—— montanensis n. s. Whitfield. (1876.)
Rep. Rec. Carroll, Mont., to Yellowstone National Park, pp. 143, 144, pl. 2, figs. 1, 2. Wash., 1876. R. P. Whitfield.
Formation: Cretaceous.
Location: Near the mouth of the Judith river, Mont.

—— quadrata n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 169, pl. 30, fig. 249. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Fort Tejon and Martinez, Cal.

—— wyomingensis n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 310, 311. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Deer creek, on North Platte, in Wyoming.

Taphius (subgen. H. & A. Ad.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 536. Wash., 1876. F. B. Meek.

Tellimera n. g. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 73. Phila., 1871. T. A. Conrad.

—— eborea Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 73. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.

—— eborea (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 164, 165, pl. 23, figs. 12–13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Near Haddonfield, N. J.

Tellina [Linn.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 82. Phila., 1834. S. G. Morton.

—— (Linn. typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

—— æqualis n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 182, 183, pl. 29, fig. 73. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— ashburnerii n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 159, pl. 23, fig. 139. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, north of Oroville, Butte county, Cal.

—— californica n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 161, pl. 30, fig. 245. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: East of Mount Diablo, near Fort Tejon, Cal.

—— ? cheyennensis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 82. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Forks of Cheyenne river, Nebr.

—— decurtata n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 158, 159, pl. 23, fig. 137. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Pence's ranch, twelve miles north of Oroville, Butte county, Cal.

—— densata n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850–1854, p. 275, pl. 24, fig. 14. Phila., 1850–1854. T. A. Conrad.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— equilateralis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 82. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of the Judith river, Nebr.

—— equilateralis (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Ter., p. 183. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of the Saint Vrain creek, Colo.

—— eufaulensis n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 277. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— ? formosa n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 179. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Twenty miles below mouth of Cannon Ball river, Nebr.

Tellina—Continued.

—— **gracilis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 82. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of the Judith river, Nebr.

—— **hoffmanniana** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 156, 157, pl. 22, figs. 133, 133*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: West of Martinez, Pence's ranch, Butte county, Cal.

—— **hoffmanniana** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 182, pl. 30, fig. 72. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: [illegible] ranch, Griswolds, Cal.

—— **hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 160, 161, pl. 30, fig. 244. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Fort Tejon, Clayton, Cal.

—— ? **isonema** n. s. Meek. (1877.)
Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 156, 157, pl. 15, fig. 6. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Chalk creek, above Coalville, Utah; East canyon creek, Wasatch range.

—— **isonema** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— **longa** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 155, 156, pl. 22, fig. 131. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; Marshs, fifteen miles east of Mount Diablo; Alizos creek, near Fort Tejon, Cal.

—— **mathewsonii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 158, pl. 23, fig. 136. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; about a mile north of the village of Pacheco, southeast of Martinez, Cal.

—— **meekiana** n. s. Whiteaves. (1874.)
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 265. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

—— **meekiana** Whiteaves. (1874.)
Geol. Sur. Can. Rep. Prog. for 1873, 1874, p. 268, pl. fig. 6. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island.

Tellina—Continued.

—— **modesta** n. s Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 157, 158, pl. 15, figs. 4, 5. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: East canyon creek, Wasatch range.

—— ? **modesta** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 236. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— ? **modesta** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **monilifera** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 157, pl. 22, figs. 134, 134*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **nitidula** n. s. M. & H. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 443. Phila., 1862. Meek & Hayden.
Formation: Cretaceous.
Location: Deer creek, a tributary of the North branch of Platte river, Nebr.

—— **occidentalis** n. s. Morton. (1841.)
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839–1842, p. 210, pl. 11, fig. 3. Phila., 1839–1842. S. G. Morton.
Formation: Cretaceous.
Location: Great bend of the Missouri river (Lat. 43° 40′ N.).

—— **occidentalis** (Mort.) Marcou. (1858.)
Geol. N. Am., p. 42. Zurich, 1858. Jules Marcou.
Formation: Cretaceous.
Location: Between Gold mount and the villages of Galisteo and Algadones, in New Mexico.

—— **parilis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 160, pl. 30, fig. 243. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

—— **prouti** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 83. Phila., 1857. Meek and Hayden.
Formation: Cretaceous.
Location: Fort Benton.

—— ? **quadrata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 159, pl. 23, fig. 138. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Cal.

—— **reichii** (Röm.) Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halb. Mang. aleutischen Inseln, p. 123. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

Tellina—Continued.

—— **remondii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 156, pl. 22, fig. 132. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Cochran's, six miles east of Mount Diablo, near Fort Tejon, Cal.

—— **remondii** Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p 182, pl. 29, fig. 71. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Tejon, Cal.

—— **ripleyana** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 327. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **scitula** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 82. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— **scitula** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 183. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Mouth of the Saint Vrain creek and in the valley of the Coche la Poudre, Colo.

—— **scitula** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 179. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear creek, near Morrison, Colo.

—— **skidegatensis** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 225, 226, pl. 30, figs. 2, 2*a*, *b*. Montreal, 1864. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bear Skin bay, Skidegate inlet.

—— **subelliptica** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 83. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Cherry creek, Nebr.

—— **subscitula** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 310. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Saline county, Kans.

—— **subtortuosa** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 272. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **undulifera** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 183, pl. 30, fig. 74. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: West of Martinez, Cal.

Tellina—Continued.

—— (**Arcopagia**) ? **cheyennensis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 607, pl. 17, fig. 16. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Forks of Cheyenne river, Dak.

—— (**Arcopagia**) **utahensis** (Meek) (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 236. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (**Arcopagia ?**) **utahensis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— (**Œne ?**) **subscitula** Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 195, 196, pl. 2, figs. 11, *a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kan.

—— (**Œne ?**) sp. undet., Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 143–144. pl. 17, fig. 10. Montreal, 1879. J. F. Whiteaves,
Formation: Cretaceous.
Location: Vesuvius bay, Salt spring, or Admiralty island.

—— (**Palæomoera ?**) **quadrata** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 144. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island.

—— (**Peronæa ?**) **aquilateralis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 196, 197 pl. 39, figs. 5*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river.

—— (**Peronæa**) **occidentalis** (Meek sp.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 144, 145, pl. 17, figs. 11, 11*a*. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gabriola island, two miles and a half up the Nanaimo river, Vancouver island.

—— (**Peronæa ?**) **scitula** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 197, 198, pl. 30, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Long lake, and on the Missouri above Fort Pierre; also on Moreau river and the South Branch of Cheyenne river.

Tellina—Continued.

—— (**Peronæoderma** ?) **mathewsoni** (Gabb) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 143. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo river, Vancouver island, two miles and a half up.

——(? **Sanguinolaria**) **whitneyi** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont, vol. 1, p. 160, pl. 30, fig. 242. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location; Jacksonville, Oregon.

—— (**Tellinella**) **georgiana** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 307. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— (**Tellinimera** (**aborea** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 238, pl. 46, fig. 14. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Alabama.

—— (**Tellinimera**) **limatula** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 278, pl. 46, fig, 10. Phila., 1858–1860. T. A. Conrad.
Formation:. Cretaceous.
Location: [Eufaula? Alabama.]

—— sp. undet. Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: Near Arneytown, N. J.

—— sp. undet. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 82. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Tellinella (subgen. Gray) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

Tellinides (subgen. Sam.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 193. Wash., 1876. F. B. Meek.

Tellinimera n. subgen. Conrad. (1860.)
Jour. Acad. Nat. Sci. Phila., vol. 4, 2d ser., 1858–1860, p. 278. Phia., 1858–1860. T. A. Conrad.

Temnochilus (subgen. McCoy) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 490. Wash., 1876. F. B. Meek.

Tenea n. g. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, pp. 72, 73. Phila., 1871. T. A. Conrad.

Tenea—Continued.

—— **paralis** n. s. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 73, pl. 3, fig. 12. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **paralis** Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 8, pl. 2, fig. 25. T. A. Conrad.
Formation: Cretaceous.
Location: Snow hill, Greene county, N. C.

—— **pinguis** (Con. sp.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 307. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— **pinguis** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 163, 164, pl. 22, figs. 1–3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, Holmdel, Upper Freehold, near Burlington and Freehold, N. J.

Terebra (Lam.) N. & G. (1840.)
Bull. Roy, Acad. Sci., Bruxelles, Tome 7, pt. 2, p. 217. Bruxelles, 1840. Nyst & Galeotti.

—— **californica** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 162, pl. 27, fig. 41. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **minuta** n. s. N. & G. (1840.)
Bull. Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, p. 217, fig. 7. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehuacan, Mexico.

Terebratella (d'Orb.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.

—— **obesa** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 205, 206, pl. 26, figs. 194, 194, *a*, *b*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Texas flat, Placer county, Cal.

—— **plicata** (d'Orb.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **plicata** (Say) Cook. (1868.)
Ann. Rep. Geol. Sur. N. J., for 1868, p. 375, fig. p. 375. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

—— **plicata** (Say) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 12–14, pl. 1, figs. 5–9. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Cream ridge and Middletown, N. J.

Terebratella—Continued.

—— **vanuxemiana (d'Orb.) Gabb. (1861.)**
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19, Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **vanuxemi (Lyell & Forbes) Whitfield. (1885.)**
Mon. U. S. Geol. Sur., vol. 9, pp. 14, 15, pl. 1, figs. 1-4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: [Cream ridge, Middletown, and other localities in New Jersey.]

Terebratula (Llhwoyd) Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 43. New Haven, 1820. Thomas Say.

—— **atlantica n. s. Morton. (1842.)**
Jour. Acad. Nat. Sci., Phila., vol. 8, 1st ser., 1839-1842, p. 214. Phila., 1839-1842. S. G. Morton.
Formation: Cretaceous.
Location: Woodward's farm, N. J.

—— **augusta n. s. H. & W. (1877.)**
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, p. 285, pl. 7, figs. 7-10. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Shoshone springs, Augusta mountains, Nev.

—— **augusta (H. & W.) White. (1880.)**
Bull. U. S. Geol. and Geog. Sur. Ter., vol. 5, No. 1, pp. 108, 109. Wash., 1880. C. A. White.
Formation: Jura-Trias [Triassic].
Location: About sixty-five miles north of the boundary line between Idaho and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles south of John Gray's lake. Locality No. 1.

—— **augusta (H. & W. ?) White. (1883.)**
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Ter., Part 1, p. 109. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Loc. No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that Territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles of Gray's lake.

—— **choctawensis n. s. Shumard. (1853.)**
Expl. Red River, La., by R. B. Marcy, pp. 207, 208, pl. 2, figs. *a*, *b*. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Near Fort Washita, Ind. Terr.

—— **choctawensis (Shum.) Conrad. (1857.)**
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. —, p. 137. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon Springs.

Terebratula—Continued.

—— **choctawensis (Shum.) Gabb. (1861.)**
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.

—— **floridana n. s. Morton. (1834.)**
Synop. Org. Rem. Cret. Gr. U. S., p. 72, pl. 16, fig. 7. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Ala.

—— **fragilis n. s. Morton. (1828.)**
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 75, 76, pl. 3, figs. 3, 4. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: New Egypt, N. J.

—— **fragilis Morton. (1830.)**
Am. Jour. Sci., 1st ser., vol. 17, p. 283. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Egypt, N. J.

—— **fragilis Morton. (1830.)**
Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 17. New Haven, 1830. S. G. Morton.

—— **fragilis Morton. (1834.)**
Synop. Org. Rem. Cret. Gr. U. S., pp. 70, 71, pl. 3, fig. 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Egypt, N. J.

—— **guadalupæ Roemer. (1852.)**
Kreide von Tex., p. 82, Taf. 6, figs. 3*a*–*d*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ford of the Guadalupe. New Braunfels, Tex.

—— **guadalupæ (Roem.) Gabb. (1861.)**
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.

—— **harlani n. s. Morton. (1828.)**
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, pp. 73, 74, pl. 3, figs. 1, 2. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **harlani Morton. (1830.)**
Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 16. New Haven, 1830. S. G. Morton.

—— **harlani Morton. (1830.)**
Am. Jour. Sci., 1st ser., vol. 17, p. 283. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Egypt, N. J.

—— **harlani Morton. (1834.)**
Synop. Org. Rem. Cret. Gr. U. S., p. 70, pl. 3, fig. 1, pl. 9, figs. 8, 9. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Egypt and other places in New Jersey.

Terebratula—Continued.

—— **harlani** (Mort.) Marcou. (1853.)

Geol. Map of the U. S. and British Provinces of N. A., p. 47, pl. 7, fig. 7. Boston, 1853. Jules Marcou.
Formation: Cretaceous.
Location: New Jersey.

—— **harlani** (Mort.) Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 18. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **harlani** (Mort.) Cook. (1868.)

Ann. Rep. Geol. Sur. N. J., for 1868, p. 375, figs. p. 375. Newark, 1868. G. H. Cook.
Formation: Cretaceous.
Location: New Jersey.

—— **harlani** (Mort.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 6–9, pl. 1, figs. 15–23. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Egypt, Timber creek, Mullica hill, Kirby's marl pits, two miles southwest of Harrisonville, N. J., Old Man creek, N. J.

—— **harlani** var. **discoidal** n. var. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 130, pl. 9, fig. 8. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: Ralph's mills, Burlington, N. J.

—— **harlani** var. **fragilis** (Mort.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 7, 8, pl. 1, figs. 15–18. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: [New Egypt, Timber creek, Mullica hill, Kirby's marl pits, two miles southwest of Harrisonville, N. J., Old Man creek, N. J.]

—— **harlani** var. **perovalis** (Mort.) Whitfield.. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 8, pl. 1, fig. 19. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Egypt, Timber creek, Mullica Hill, Kirby's marl pits, two miles southwest of Harrisonville, N. J.; Old Man's creek, N. J.

—— **harlani** var. **rectilateral** n. var. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 130, pl. 9, fig. 9. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: Ralph's mills, Burlington county, N. J.

—— **harlani** (Morton.) Bronn. (1838.)

Lethaea Geognostica, Zweiter Band, p. 661. Stuttgart, 1838. H. G. Bronn.
Formation: Cretaceous.
Location: New Egypt, N. J.

—— **harlani** (Mort.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 221–223. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

Terebratula—Continued.

—— **helena** n. s. Whitfield. (1875.)

Rep. Rec. Black Hills of Dak., pp. 103, 104, pl.—, figs. 7–9. Wash., 1875. R. P. Whitfield.
Formation: Cretaceous.
Location: On the northeast side of the Black hills, a few miles north of the Belle Fourche.

—— **humboldtensis** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 34, pl. 6, figs. 35, 35a, b. Phila., 1864. W. M. Gabb.
Formation: Triassic.
Location: Star canyon, Humboldt county, Nev.

—— **humboldtensis** (Gabb) H. & W. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 282, 283, pl. 6, figs. 22–24. Wash., 1877. Hall & Whitfield.
Formation: Triassic.
Location: Near Dun Glen pass, Pah-Ute range, Nev.

—— **humboldtensis** (Gabb) Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 129. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: McDonald river, on Nicola lake, Canada.

—— **lachryma** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 130, pl. 10, fig. 11. New Haven, 1833. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina.

—— **lachryma** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 72, pl. 10. fig. 11; pl. 16, fig. 6. Phila., 1834. S. G. Morton.
Formation: Cretaceous [Tertiary].
Location: South Carolina; below Claiborne, Ala.

—— **leonensis** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 164, pl. 21, fig. 2. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon Springs [Texas].

—— **liardensis** n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 130, 131, pl. 17, figs. 2, 2a–c. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about twenty-five miles below Devil's portage; also about thirty miles below the same portage, Canada.

—— **obesa** (Gabb) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 245, 246. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay.

—— **perovalis** ? (Sow.) Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, pp. 77–79, pl. 3, figs. 7, 8. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Terebratula—Continued.

—— **plicata** n. s. Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, pp. 43, 44. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: New Jersey.

—— **robusta** n. s. Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 163, 164, pl. 22, figs. 1, 1*a*, *b*, and 2. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest territory.

—— **sayi** n. s. Morton. (1828.)

Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1828–1831, pp. 76, 77, pl. 3, figs. 5. 6. Phila., 1828–1831. S. G. Morton.
Formation: Cretaceous.
Location: Woodward's farm, near Walnford, Burlington county, N. J.

—— **sayi** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 283. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **sayi** Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 18, pl. 3, figs. 14, 15. New Haven, 1830. S. G. Morton.

—— **sayi** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 71, pl. 3, figs. 3, 4. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Woodward's farm, near Walnford, Burlington county, N. J.

—— **semisimplex** n. s. White. (1880.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 5, No. 1, p. 108. Wash., 1880. C. A. White.
Formation: Jura-Trias. [Triassic].
Location: About sixty-five miles north of the boundary line between Idaho and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles south of John Gray's lake, locality No. 1.

—— **semisimplex** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 108, 109, pl. 31, figs. 3*a–c*. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Location No. 1. Within the limits of Idaho, about sixty-five miles north of the boundary line between that Territory and Utah, about eighteen miles west of the boundary line between Idaho and Wyoming, and about five miles west of Gray's lake.

—— **vanuxemiana** n. s. Forbes. (1844.)

Quart. Jour. Geol. Soc., London., vol. 1, p. 62, figs. —, p. 62. London, 1845. Edward Forbes.
Formation: Cretaceous.
Location: New Jersey.

Terebratula—Continued.

—— **wacoensis** n. s. Roemer. (1852.)

Kreide. von Texas, pp. 81, 82, Taf. 6, figs. 2*a–c*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Waco camp on the Guadalupe above New Braunfels, Tex.

—— **wacoensis** (Roemer) Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 147. pl. 3, fig. 1. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Aroyo Pedras Pintas.

—— **wacoensis** (Roemer) Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 18. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Texas.

—— **wacoensis** (Roemer) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 177. Montreal. 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Banks of the Trent river, Vancouver island.

—— [**Llhwyd**] Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, p. 45. New Haven, 1820. Thomas Say.
Formation: Cretaceous.
Location: New Jersey.

—— **sp. undet.** Roemer. (1849.)

Texas, p. 408. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Waco camp on the Guadalupe above New Braunfels, Tex.

—— **sp. undet.** Meek. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 41, pl. 8, figs. 2, 2*a*, *b*. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

—— **sp. undet.** Whiteaves. (1878.)

Geol. Sur. Can., Rep. Prog. for 1876–1877, pp. 150, 151. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake and Iltasyouco river, British Columbia.

—— (?) **sp. undet.** Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 84. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— (?) **sp. undet.** Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, p. 84. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **sp. undet.** Whiteaves. (1878.)

Canadian Naturalist, vol. 8, n. ser., No. 7, pp. 400, 401. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Sigutlat lake and Iltasyouco river.

Tellina ooides n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 157, 158, pl. 22, figs. 135, 135*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: West of Martinez, Pence's Ranch, Butte county, Cal.

Terebratulina (d'Orb.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.

—— atlantica (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 9-11, pl. 1, figs. 10-13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Farmingdale, Shark river, Woodward's farm, N. J.

—— filosa n. s. Conrad. (1866.)
~~Am. Jour. Conch., vol. 2, p. 77,~~ pl. 9, figs. 4, 5. Phila., 1866. T. A. Conrad.
Formation: Cretaceous.
Location: Alabama.

—— floridana (Mort.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 11, 12. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey?

—— floridi[a]na (d'Orb.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Alabama.

—— halliana n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— lachryma (d'Orb.) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 19. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

Terebratella plicata (Say.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 224, 225. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Marlboro and Nut swamp, N. J.

Terebrispira subgen. (Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 356. Wash., 1876. F. B. Meek.

Teredo (Linn.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.

—— (Linn. typical) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 261. Wash., 1876. F. B. Meek.

—— antenautæ ? (Sow.) Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827-1831, p. 123. Phila., 1827-1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

Teredo—Continued.

—— antenautæ ? (Sow.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: Chesapeake and Delaware canal, and New Jersey.

Teredo calamus n. s Tuomey. (1854.)
Proc. Acad. Nat. Sci., Phila., vol. 7, p. 170. Phila., 1856. M. Tuomey.
Form: Cretaceous.
Location: Columbus, Miss.

—— contorta n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 323, 324. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— globosa n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, p. 53. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Square butte, near Fort Clark.

—— globosa (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 264, 265, pl. 30, fig. 13, figs. 31, 32, p. 264. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fort Clark, on the Missouri, [N. Dak.]

—— irregularis n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 393, pl. 68, fig. 19. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— irregularis (Gabb) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 191, 192, pl. 25, figs. 18, 19. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey.

—— pugetensis n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 62, pl. 7. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Carbonado, Wash.

—— selliformis n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 178, 179. Phila., 1861. Meek & Hayden.
Formation: Cretaceous.
Location: Fort Clark, on the Missouri, Nebr. [N. Dakota.]

—— selliformis (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 262, 263, pl. 17, figs. 19*a*-*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Fort Clark, on the Missouri, [N. Dak.]

—— socialis Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, p. 157. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

Teredo—Continued.

—— **suciensis** n. s. Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 135–137, pl. 17, figs. 1, 1*a*. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Southwest of Denman island, Sucia islands.

—— **suciensis** Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 218, 219, pl. 29, fig. 1. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: North shore of Cumshewa inlet.

—— **suciensis** (Whiteaves?) White. (1889.)

Bull. U. S. Geol. Sur. No. 51, p. 44. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Sucia island.

—— sp. undet. Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges. Band 22, p. 236. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: New Jersey.

—— **tibialis** n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 292, (pl. 9, fig. 2, [vol. 24]). New Haven, 1833. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey.

—— **tibialis** Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 24, p. 9, fig. 2. New Haven, 1833. S. G. Morton.

—— **tibialis** Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., pp. 68, 69, pl. 9, fig. 2. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey.

—— **tibialis** (Morton) Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 366. Phila., 1862. W. M. Gabb.

Formation: Cretaceous.

—— **tibialis** (Morton) Cook. (1868.)

Ann. Rep. Geol. Sur. N. J., for 1868, p. 376, fig. —. Newark, 1868. G. H. Cook.

Formation: Cretaceous.

Location: New Jersey.

—— **tibialis** (Mort.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 201–203, pl. 26, figs. 19–22. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Timber creek and near New Egypt, N. J.

—— sp. undet. Roemer. (1849.)

Texas, p. 408. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: [Ford near New Braunfels] Texas.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 44. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Ford of the Guadalupe, New Braunfels, Tex.

Teredo—Continued.

—— ? White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 184. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Valley of Little Thompson creek, Colo.

—— sp. undet. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 206. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Sage creek, Col.

Tessarolax n. g. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1 p. 126. Phila., 1864. W. M. Gabb.

—— **distorta** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 126, 127, pl. 20, figs. 22, 22*a*, *b*. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Tuscan springs, Tehama county, Cal.

—— **distorta** Gabb. (1868.)

Am. Jour. Conch., vol. 4, p. 146, pl. 14, figs. 18, 19. Phila., 1868. W. M. Gabb.

Formation: Cretaceous.

—— **distorta** (Gabb) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1. pt. 2, p. 123. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Banks of the Trent river, below the falls, Vancouver island.

—— **hitzii** n. s. White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 29, 30, pl. 15, fig. 2*a*. Wash., 1880. C. A. White.

Formation: Cretaceous.

Location: Fort Shaw, near Muscle Shell river, Mont.

Textilaria americana Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 4*a*. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Missouri region.

—— **americana** ? Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 7. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Missouri region.

—— **euryoonus** Ehrenberg.

Mikrogeologie, Taf. 32, fig. 9. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Missouri region.

—— **globulosa** Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 8. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Missouri region.

—— **globulosa** Ehrenberg. (1854.)

Mikrogeologie, Taf. 32, fig. 12. Leipzig, 1854. C. G. Ehrenberg.

Formation: Cretaceous.

Location: Mississippi region.

Textilaria—Continued.

—— **gomphoconus** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 10. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **inflata** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 13. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **missouriensis** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 5. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **poroconus** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 6. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

—— **striata** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, figs. 11 and 14. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **striata** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 4*b*. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Missouri region.

Textularia agglutinans var. pygmæa (d'Orb.) Dawson. (1874.)
Canadian Naturalist, vol. 7, n. ser., pp. 253, 254, fig. 1, *b*. Montreal, 1875. G. M. Dawson.
Formation: Cretaceous.
Location: About twenty miles north of the forty-ninth parallel, on the escarpment called Pembina mountain, Manitoba.

—— **agglutinans var. pygmæa** (d'Orb.) Dawson. (1875.)
British N. Am. Bound. Com., Rep. Geol. and Res. Forty-ninth Parallel, p. 79, pl. 17, fig. 2*a*. Montreal, 1875. G. M. Dawson.
Formation: Cretaceous.
Location: Boyne river, Manitoba, Canada.

—— **gibbosa var. globulosa** (Ehr.) Dawson. (1875.)
British N. Am. Bound. Com., Rep. Geol. and Res. Forty-ninth Parallel, p. 79, pl. 17, fig. 2*a*. Montreal, 1875, G. M. Dawson.
Formation: Cretaceous.
Location: Boyne river, Manitoba, Canada.

—— **globulosa** (Ehrenberg) Dawson. (1874.)
Canadian Naturalist, vol. 7, n. ser., p. 253, fig. 1, *a*. Montreal, 1875. G. M. Dawson.
Formation: Cretaceous.
Location: About twenty miles north of the forty-ninth parallel, on the escarpment called Pembina mountain, Manitoba.

Thaumastus (Albers) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 553. Wash. 1876. F. B. Meek.

—— **limnæiformis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 553, 554, pl. 44, figs. 8*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Opposite the mouth of Yellowstone river, northwestern Dakota.

—— **limnæiformis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 88. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Near mouth of Yellowstone river, Mont.

—— **limnæiformis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 464, pl. 25, fig. 24. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **limnæiformis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 20, pl. 3, fig. 3. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rosebud river, township 27, range 25, west of fourth principal meridian; Three Hills creek, township 30, range 23, west of fourth meridian, Canada.

—— **limnæiformis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 27, pl. 3, figs. 3*a*, *b*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Wood End depot, Souris river, and Pyramid creek, Canada.

—— **limnæiformis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 72. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, six miles above the mouth of Bow river, Canada.

Theliostyla subgen. (Mörch) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 170. Phila., 1869. W. M. Gabb.

Thetiopsis (Meek) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 152. Montreal, 1879. J. F. Whiteaves.

—— **circularis** (M. & H. sp.) Whiteaves. (1879.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 153. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Hornby island, northwest side; Nanaimo river, Vancouver island, ten miles up; Sucia islands.

Thetis (Sby.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 186. Phila., 1869. W. M. Gabb.

—— **affinis** nom. prov. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 226, 227, pl. 30, figs. 4, 4a, *b*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bear Skin bay, Skidegate inlet.

—— ? **circularis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 190, 191, pl. 17, figs. 8*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Near Black hills, on Cheyenne river; also near the mouth of Milk river, on the Missouri.

—— ? **circularis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 206. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Sage creek, Colo.

—— **circularis** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 417, pl. 11, figs. 22-24. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Near the forks of the Cheyenne river, and near the mouth of Rapid creek, Black hills, Dak.

—— ? **elongata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 186, pl. 30, figs. 80, 80*a*. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Vicinity of Cottonwood creek, Cal.

Thracia (Leach) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 101, 102. Wash., 1865. Meek & Hayden.

—— ? **arcuata** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 182. Phila., 1861. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills, Nebr. [S. Dak.]

—— ? **arcuata** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 102, pl. 4, fig. 8. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— **gracilis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 224, 225, pl. 39, figs. 6*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Idaho Ter., on the Missouri.

—— ? **occidentalis** n. s. Meek. (1858.)
Trans. Albany Inst., vol. 4, pp. 43, 44. Albany, 1856-1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

Thracia—Continued.

—— ? **occidentalis** Meek. (1876.)
Bull. U. S. Geol. and Geogr. Sur. Terr, vol. 2, No. 4, p. 363, pl. 2, figs. 3, 3*a*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— **myæformis** n. s. White. (1879.)
Proc. U. S. Nat. Mus., vol. 2, pt. 2, pp. 297, 298, pl. 6, figs. 1, 2. Wash., 1880. Smithson. Misc. Coll., vol. 19. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Bell county, Tex.

—— **myæformis** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 23, pl. 17, figs. 2*a*, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Bell county, Tex.

—— ? **prouti** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 225, 226, pl. 37, figs. 6*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Idaho Ter., on the Missouri.

—— **semiplanata** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 221, 222, pl. 29, figs. 5, 5*a–c*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay; Bear Skin bay, Skidegate inlet; South island.

—— **subgracilis** n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, p. 36. Wash., 1877. R. P. Whitfield.
Formation: Cretaceous.
Location: Near French creek, on Cheyenne river, Dak.

—— **subgracilis** Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 419, 420, pl. 11, figs. 29, 30. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: Near French creek, on the Cheyenne river, Black hills, Dak.

—— ? **sublevis** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 182. Phila., 1861. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills, Nebr. [S. Dak.]

—— ? **sublævis** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 102, pl. 4, figs. 4, 4*a*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— ? **sublevis** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 375, pl. 5, fig. 34. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Redwater valley, Black hills.

Thracia—Continued.

—— subtortuosa (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 223, 224, pl. 37, fig. 5. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Idaho Ter., on the Missouri.

—— ? subtruncata n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, pp. 44. Albany, 1858–1864. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— ? subtruncata Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr, vol. 2, No. 4, pp. 363, 364, pl. 2, figs. 4, 4a. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island.

—— subtruncata (Meek) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 140. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Nanaimo, Vancouver island, Sucia islands.

—— (Corimya) grinnelli n. s. Whitfield. (1876.)

Rep. Rec. Carroll, Mont., to Yellowstone National Park, pp. 144, 145, pl. 2, figs. 6, 7. Wash., 1876. R. P. Whitfield.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— (Periploma) simplex (d'Orb.) Eichwald. (1871.)

Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, p. 121. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kadiak island, Alaska.

—— sp. undet. Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, p. 56. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— sp. undet. Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, p. 1, p. 57. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— sp. undet. Whiteaves. (1877.)

Geol. Sur. Can. Rep. Prog. for 1875, 1876, App. II, pp. 96, 97. Montreal, 1877. J. F. Whiteaves.
Formation: Jurassic or Cretaceous.
Location: Rock Island gates, below Hudson's hope, Peace river.

Thylacus n. g. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 290. Phila., 1858–1860. T. A. Conrad.

—— cretaceus n. s. Conrad. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 290, pl. 46, fig. 22. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Ala. [Miss.].

Tiara humerosa Meek. (1870.)

Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 451. Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Elk station, Central Pacific railroad, beyond Salt lake.

Torcula ? [Gray.] Conrad. (1869.)

Am. Jour. Conch. vol. 5, Phila., 1869, 1870, p. 45, pl. 1, fig. 15. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: New Jersey.

Torni[a]tella [Lam.] Morton. (1834)

Synop. Org. Rem. Cret. Gr. U. S., p. 48. Phila., 1834. S. G. Morton.

Tornatella (Lam.) Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 194. Boston, 1862. B. F. Shumard.

—— ? bullata n. s. Morton. (1833.)

Am. Jour. Sci., 1st ser., vol. 23, p. 292, pl. 5, fig. 3. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.

Torni[a]tella ? bullata Morton. (1834.

Synop. Org, Rem. Cret. Gr. U. S., p. 48, pl. 5, fig. 3. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Tornatella texana n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 194. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Red river, Lamar county, Tex.

Torni[a]tella sp. undet. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 48. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Tornatella sp. undet. Forbes. (1844.)

Quart. Jour. Geol. Soc. London, vol. 1, p. 63, fig. c, p. 63. London, 1845. Edward Forbes.
Formation: Cretaceous.
Location: New Jersey.

Toxaster elegans (Shum.) Hall. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 146, pl. 21, figs. 1a–e. Wash., 1857. James Hall.
Formation: Cretaceous.
Location: Eagle springs, Tex.

—— texanus n. s. Roemer. (1849.)

Texas, p. 393. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— texanus Roemer. (1852.)

Kreide von Texas, pp. 85, 86, Taf. 10, figs. 3a–c. Bonn, 1852. F. Roemer.
Formation Cretaceous.
Location: Fredericksburg, Tex.

—— texanus (Roem.) Hall. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 145, pl. 1, figs. 2a–c. Wash., 1857. James Hall.
Formation: Cretaceous.
Location: Leon springs, Tex.

Trachycardium subgen. (Mörch.) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 282. Phila., 1858–1860. T. A. Conrad.

Trachyceras (Laube) Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt, 1, p. 116. Wash., 1877. F. B. Meek.

—— canadense n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 142–144, pl. 18, figs. 4, 4a. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about twenty-five miles below Devil's portage, Canada.

—— judicaricum (Mojsisovics) Meek. (1870.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, p. 118, pl. 11, figs. 1, 1a. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Cottonwood canyon, West Humboldt range, Nev.

—— whitneyi (Gabb) Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 116–118, pl. 11, figs. 3, 3a. Wash., 1877. F. B. Meek.
Formation: Triassic.
Location: Cottonwood canyon, West Humboldt range, Nev.

Trachytriton n. g. Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 37. Wash., 1864. F. B. Meek.

—— (subgen. Meek) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2. Phila., 1869. W. M. Gabb.

—— vinculum (M. & H.) Meek. (1864.)
Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 37. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Dakota.

—— vinculum (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 304–306, pl. 19, figs. 7a–d. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Great bend of the Missouri river, Dak.

Trapezium (Humph.) Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont., Black Hills, p. 18. Wash., 1877. R. P. Whitfield.

—— bellefourchensis n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, pp. 18, 19. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: East of Belle Fourche, Black hills, Dak.

—— bellefourchensis Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 364, 365, pl. 5, figs. 1–4. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: East of the Belle Fourche river, near Bear Lodge butte, Black hills.

Trapezium—Continued.

—— micronema n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 493. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Bear River city, on Sulphur creek, Wyo.

—— ? micronema (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 293, pl. 10, fig. 5. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River city, on Sulphur creek, Wyo.

—— subequalis n. s. Whitfield. (1877.)
U. S. Geogr. and Geol. Sur. Rocky Mt. Region; Prelim. Rep. Paleont. Black Hills, pp. 19, 20. Wash., 1877. R. P. Whitfield.
Formation: Jurassic.
Location: Red Canyon creek, Black hills, Dak.

—— subequalis Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 365, 366, pl. 5, figs. 5–8. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Red Canyon creek, Black hills, Dak.

—— truncatum (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 292, 293, pl. 10, figs. 6a–b. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Vicinity of Salt lake, Utah.

Trematodiscus (subgen. M. & W.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 491. Wash., 1876. F. B. Meek.

Trematopygus crucifer (Mort.) d'Orb. (1855.)
Paleont. Francaise, Echinoides Irreguliers, Terr. Crét. t. Sixième, pp. 387, 388, pl. 953, figs. 10, 11; pl. 963, figs. 1–5. Paris, 1853–1860. A. d'Orbigny.
Formation: Cretaceous.
Location: New Jersey.

—— crucifer (Morton) Clark. (1891.)
Johns Hopkins Univ. Cir., vol. 10, No. 87, p. 76. Baltimore, 1891. Wm. B. Clark.
Formation: Cretaceous—Middle Marl Bed.
Location: New Jersey.

Trichotropis (Sow.) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333. Phila., 1855–1858. T. A. Conrad.

—— cancellaria n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333, pl. 35, fig. 8. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

Trigonarca Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 43. Phila., 1870. T. A. Conrad.

Trigonarca—Continued.

—— (Conrad) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 90. Wash., 1876. F. B. Meek.

—— **cuneata** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 316, 317. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Clay county, Ga.

—— **cuneiformis** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 98, pl. 9, fig. 1. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **cuneiformis** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 88, 89, pl. 12, figs. 17–18. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **passa** n. s. Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 43, pl. 1, fig. 17. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **transversa** (Gabb) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 89–91, pl. 12, figs. 13–16. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Burlington, Mullica Hill, and perhaps Arneytown, N. J.

Trigonellites (Parkinson) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 118–121, figs. 1–4 text. Wash., 1865. Meek & Hayden.

Trigonia [Brug.] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 65. Phila., 1834. S. G. Morton.

—— **æquicostata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 196. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Orestimba canyon; Curry's, south of Mount Diablo, Cal.; Jacksonville, Oregon; Martinez; Cottonwood creek, Cal.

—— **aliformis** (Park.) Roemer. (1849.)
Texas, p. 404. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg and ford, near Braunfels, Tex.

—— **americana** (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 148, pl. 38, figs. 1*a*, *b*. Wash., 1880. C. A. White.
Formation: Jurassic.
Location: Near lower canyon of Yellowstone river, Mont.

Trigonia—Continued.

—— **angulicostata** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 312, 313. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— **cerulia** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 114, 115, pl. 14, fig. 7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Deep cut on the Holmdel and Keyport turnpike, Monmouth county, N. J.

—— **conradi** n. s. M. & H. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, pp. 183, 184. Phila., 1861. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills, Neb. [S. Dak.]

—— **conradi** M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 83, 84, pl. 3, fig. 11. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— **consobrina** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, pp. 182, 183, Taf. 14, fig. 7. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **crenulata** (Lam.) Roemer. (1852.)
Kreide. von Texas, pp. 51, 52, Taf. 7, fig. 6. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— **crenulata** (Lam.) Shumard. (1853.)
Expl. Red River, La., by R. B. Marcy, p. 206, pl. 4, fig. 1. Wash., 1853. B. F. Shumard.
Formation: Cretaceous.
Location: Cross Timbers, Tex.

—— **dawsoni** n. s. Whiteaves. (1878.)
Canadian Naturalist, vol. 8, n. ser., No. 7, p. 4 Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river and Sigutlat lake.

—— **dawsoni** Whiteaves. (1878.)
Geol. Sur. Can., Rep. Prog. for 1876–1877, pp. 154, 155. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic.
Location: Iltasyouco river and Sigutlat lake, British Columbia.

—— **dawsoni** Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 231, 232, pl. 31, figs. 1, 1a. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South side of Alliford bay.

—— **dawsoni** Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont. vol. 1, pt. 2, pp. 167, 168. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest territory.

Trigonia—Continued.

—— **devexa** n. s. Eichwald. (1871.)

Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, p. 183, Taf. 14, figs. 5, 6. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Alaska.

—— **diversicostata** n. s. Whiteaves. (1876.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 68-70, pl. 10, fig. 1. Montreal, 1876. J. F. Whiteaves.

Formation: Cretaceous.

Location: Queen Charlotte islands.

—— **diversicostata** Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 230. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: Bear Skin bay, Skidegate inlet.

—— **doroschini** n. s. Eichwald. (1871.)

Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, pp. 180-182, Taf. 13, figs. 12-14; Taf. 14, figs. 1-4. St. Petersburg, 1871. E. Eichwald.

Formation: Cretaceous.

Location: Egge, Tukusitnu bay, Alaska.

—— **emoryi** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 148, pl. 3, figs. 2*a*-*c*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera.

—— **eufalensis** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 396, pl. 68, fig. 32. Phila., 1858-1860. W. M. Gabb.

Formation: Cretaceous.

Location: Eufaula, Ala.

—— **eufalensis** (Gabb) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 113, 114, pl. 14, figs. 1-4. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: At the crossing of the West Jersey railroad at a creek between Red bank and Gloucester, N. J.; also in Monmouth county, N. J.

—— **evansana** n. s. Meek. (1858.)

Trans. Albany Inst., vol. 4, pp. 42, 43. Albany, 1858-1864. F. B. Meek.

Formation: Cretaceous.

Location: Nanaimo, Vancouver island.

—— **evansana** (Meek) Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 161. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Northwest bay, Vancouver island.

—— **evansana** (Meek) White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 39. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Sucia island.

Trigonia—Continued.

—— **evansi** Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 359, 360, pl. 2, figs. 7, 7*a*, 7*b*. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Nanaimo, Vancouver island.

—— **evansii** (Meek) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 189, pl. 25, fig. 177. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Tuscan springs, Tehama county; Chico creek, Butte county; Curry's, south of Mount Diablo; Benicia, Martinez, Rancho de San Luis Gonzaga, Pacheco's pass, Cal.; Jacksonville and Siskiyou mountains, Oregon; Nanaimo, Vancouver island.

—— **gibboniana** (Lea ?) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 190, pl. 17, fig. 178; pl. 31, fig. 262. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Near Martinez, Cal.; Jacksonville, Oregon.

—— **intermedia** (Fahrenkohl) Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, p. 262. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: South side of Alliford bay.

—— **leana** n. s. Gabb. (1876.)

Proc. Acad. Nat. Sci. Phila. for 1876, p. 812. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: California.

—— **limbata** (d'Orb.) Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges. Band 22, pp. 234, 235. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: Woodbury, N. J.

—— **maudensis** n. s. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can. Mes. Foss., vol. 1, pt. 3, pp. 230, 231, pl. 31, fig. 2. Montreal, 1884. J. F. Whiteaves.

Formation: Cretaceous.

Location: North side of Maud island; South island, north side of Cumshewa inlet.

—— **montanaensis** (Meek) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 147, 148, pl. 38, fig. 2*a*. Wash., 1880. C. A. White.

Formation: Jurassic.

Location: Near the lower canyon of the Yellowstone, Mont.

—— **mooreana** Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 269. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

Trigonia—Continued.

—— **mortoni n. s. Whitfield. (1885.)**
Mon. U. S. Geol. Sur., vol. 9, pp. 112, 113, pl. 14, figs. 5, 6. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Freehold, Burlington, Monmouth, Holmdel, N. J.

—— **nana n. s. Eichwald. (1871.)**
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, p. 180, Taf. 14, fig. 8. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Tukusitnu bay, Alaska.

—— **pandicosta n. s. Meek. (1864.)**
Geol. Sur. Cal. Paleont., vol. 1, pp. 48, 49, pl. 8, fig. 7. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

—— **plicato-costata n. s. N. & G. (1840.)**
Bull. Roy. Acad. Sci., Bruxelles, Tome 7, pt. 2, pp. 212, 213, fig. 1. Bruxelles, 1840. Nyst & Galeotti.
Formation: Jurassic.
Location: Tehuacan, Mexico.

—— **quadrangularis n. s. H. & W. (1877.)**
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 2, pp. 293, 294, pl. 7, fig. 22. Wash., 1877. Hall & Whitfield.
Formation: Jurassic.
Location: Near Como, Laramie plains, Wyo.

—— **texana n. s. Conrad. (1857.)**
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 148, pl. 3, figs. 3a–c. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Leon springs.

—— **thoracica n. s. Morton. (1834.)**
Synop. Org. Rem. Cret. Gr. U. S., p. 65, pl. 15, fig. 13. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey and Alabama.

—— **thoracica (Mort.) Roemer. (1852.)**
Kreide. von Texas, p. 52. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Ravine three miles from New Braunfels on road to Seguin, Tex.

—— **thoracica (Mort.) Gabb. (1860.)**
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 304, 305, pl. 47, fig. 10. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Tennessee.

—— **thoracica (Mort.) Conrad. (1860.)**
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 282, pl. 47, fig. 10. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **thoracica (Mort.) Gabb. (1876.)**
Proc. Acad. Nat. Sci., Phila., for 1876, p. 312. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Trigonia—Continued.

—— **tryoniana n. s. Gabb. (1864.)**
Geol. Sur. Cal. Paleont., vol. 1, pp. 188, 189, pl. pl. 25, fig. 176. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

—— **tryoniana (Gabb) Whiteaves. (1879.)**
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, p. 161, pl. 18, fig. 7. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **? [Brug.] Morton. (1830.)**
Am. Jour. Sci., 1st ser., vol. 17, p. 285. New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location:

—— **sp. A. Whiteaves. (1874.)**
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 262. Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **sp. B. Whiteaves. (1874.)**
Geol. Sur. Can., Rep. Prog. for 1873, 1874, p. 262, Montreal, 1874. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest bay, Vancouver island.

—— **sp. undet. White. (1875.)**
Rep. Geogr. and Geol. Expl. and Sur. west of One-hundreth Meridian, vol, 4, pt. 1, p. 167. Wash., 1875. C. A. White.

—— **sp. undet. Whiteaves. (1876.)**
Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp. 70–72, pl. 10, figs. 2, 2a. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— **sp. undet. Urquiza. (1882.)**
An. Min. Fomento Rep. Mex., Tomo 7, p. 224, fig. 15. Mexico, 1882. M. Urquiza.
Formation: Cretaceous.
Location: Astala, Coalcoman district, state of Michoacan, Mexico.

—— **sp. undet. Hill. (1889.)**
Geol. Sur. Tex., Bull. No. 4, p. 11. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: North of Webberville, Tex.

Trigonoarca Conrad. (1867.)
Am. Jour. Conch., vol. 3, p. 9. Phila., 1867. T. A. Conrad.

—— **maconensis Conrad. (1867.)**
Am. Jour. Conch., vol. 3, p. 9. Phila. 1867. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, New Jersey.

—— **perovalis Conrad. (1872.)**
Proc. Acad. Nat. Sci., Phila., for 1872, p. 55, pl. 2, fig. 4. Phila., 1872. T. A. Conrad.
Formation: Cretaceous.

Trigonoarca—Continued.

—— **saffordii** (Gabb) Conrad. (1872.)
Proc. Acad. Nat. Sci., Phila., for 1872, p. 55, pl. 2, fig. 3. Phila., 1872. T. A. Conrad.
Formation: Cretaceous.

—— **triquetra** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 2, pl. 1, fig. 7. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, N. C.

—— **tumida** n. s. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 235, 236, pl. 31, fig. 6. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island.

—— **tumida** Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 167. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: Rocky mountains, three miles north of the east end of Devil's lake, Northwest Territory.

—— (**Breviarca**) **congesta** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 3, pl. 1, fig. 2. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, N. C.

—— (**Breviarca**) **carolinensis** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 3, pl. 1, fig. 4. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, N. C.

—— (**Breviarca**) **exigua** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 93, 94, pl. 15, figs. 2*a–f*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Milk river, on the Missouri, and near the forks of Cheyenne river.

—— (**Breviarca**) **perovalis** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 3, pl. 1, fig. 3. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, N. C.

—— (**Breviarca** ?) **salinaensis** n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 92, 93, pl. 2, figs. 1*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina Kans.

Trigonoarca—Continued.

—— (**Breviarca** ?) **siouxensis** (H. & M.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 92, pl. 1, fig. 6. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Big Sioux river, on the Missouri.

—— (**Breviarca**) **umbonata** n. s. Conrad. (1875.)
Rep. Geol. Sur. N. C., vol. 1. Raleigh, 1875. W. C. Kerr. App. A, p. 3, pl. 1, fig. 8. T. A. Conrad.
Formation: Cretaceous.
Location: Snow Hill, Greene county, N. C.

Trigonodus (?) **productus** n. s. Whiteaves. (1889.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, pp. 135, 136, pl. 17, figs. 7, 7*a*, *b*. Montreal, 1889. J. F. Whiteaves.
Formation: Triassic.
Location: Liard river, about thirty miles below Devil's portage, Canada.

Tritonidea (subgen. Swainson) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 378. Wash., 1876. F. B. Meek.

Tritonium (Link) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 94. Phila., 1864. W. M. Gabb.

—— **californicum** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 154, pl. 26, fig. 33. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Tejon, Cal.

—— **diegoensis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 95, pl. 18, fig. 44. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location; San Diego, Cal.

—— **hornii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 94, pl. 28, fig. 208. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon; Cochran's, near Mount Diablo, Cal.

—— **paucivaricatum** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 2, p. 95, pl. 28, figs. 209, 209*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon, Cal.

—— **whitneyi** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 96, pl. 28, figs. 210, 210*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Alizos creek, near Fort Tejon, Cal.

—— (**Lagena** ?) **edentatum** n. s. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 381. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

Tritonium—Continued.

—— **(Lagena?) interruptum** (Con.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, pp. 281, 282. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— **(Trachytriton) fusiformis** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 155 Phila., 1869. W. M. Gabb.

—— **(Trachytriton) tejonensis** n. s. Gabb. 1869.
Geol. Sur. Cal. Paleont., vol. 2, pp. 154, 155, pl. 26, fig. 34. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Arroyo de los Alizos, Tejon, Cal.

Tritonofusus (subgen. Beck) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 146. Phila., 1869. W. M. Gabb.

Trochactæon cylindraceus (Stoliczka) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 218, pl. 28, fig. 6. Montreal, 1884 J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island, opposite Leading island.

Trochosmilia (M. Edw.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 399. Phila, 1858–1860. W. M. Gabb.

—— **conoides** (G. & H.) Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 399, pl. 69, figs. 12–14. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **? granulifera** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 208, pl. 26, figs. 196, 196*a*. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Chico creek, Cal.

—— **? inauris** (Mort.) Bölsche. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 215. Berlin, 1870. Wilh. Bölsche.
Formation: Cretaceous.
Location: Brownville and Squankum, N. J.; Alabama.

—— **striata** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 207, 208, pl. 26, fig. 195. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Near the coal mines at Mount Diablo, Cal.

Trochus [Linn] Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 46. Phila., 1834. S. G. Morton.

Trochus—Continued.

—— **aleuticus** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, p. 155, Taf. 12, figs. 2, 3. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaskan peninsula.

—— **leprosus** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 46, pl. 15, fig. 6. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Prairie bluff, Alabama.

—— **mortonii** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 321. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Alabama.

—— **orientalis** n. s. Eichwald. (1871.)
Geogr.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, pp. 155, 156, Taf. 12, fig. 1. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **texanus** n. s. Roemer. (1888.)
Paleont. Abhandl. Vierter Band, Heft 4, p. 15, Taf. I [XXXI], fig. 13. Berlin, 1888. F. Roemer.
Formation: Cretaceous.
Location: Two miles above the mouth of Barton's creek, near Austin, Tex.

—— **(Anadema) gemiferus** n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 17, 18, pl. 4, figs. 8, 9. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Near Pence's ranch, Butte county, Cal.

—— **(Oxystele) eurostomus** n. s. White. (1885.)
Bull. U. S. Geol. Sur., No. 22, p. 12, pl. 5, figs. 9–11. Wash., 1885. C. A. White.
Formation: Cretaceous.
Location: Shore of Todos Santos bay, Lower California.

—— (Lam.) Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 122. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

—— **sp. undet.** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 282, New Haven, 1830. S. G. Morton.
Formation: Cretaceous.
Location: [New Jersey?]

Trophon (Montfort) White. (1889.)
Bull. U. S. Geol. Sur., No. 51, p. 21. Wash., 1889. C. A. White.

—— **condoni** n. s. White. (1889.)
Bull. U. S. Geol. Sur., No. 51, pp. 21, 22, pl. 3, figs. 4, 5. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Little Cow creek valley, about 18 miles east of Redding, Shasta county, Cal.

Tropidina (subgen. H. & A. Adams) M. & H. (1865.)
Paleont. Upper Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 113. Wash., 1865. Meek & Hayden.

Tropidocardium (subgen. Roem.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 166. Wash., 1876. F. B. Meek.

Truncatulina (d'Orb) Reuss. (1861.).
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb. 1861, Band XLIV, p. 338. Wien, 1862. A. E. Reuss.

—— **dekayi** n. s. Reuss. (1861).
Math.-Naturw. Cl. Kaiserl. Akad. Wiss. Sitzungsb. 1861, Band XLIV, p. 338, Taf. VII, fig. 6. Wein 1862. A. E. Reuss.
Formation: Cretaceous.
Location: New Jersey.

Tuba ? (Lea) Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 289. Phila., 1858–1860. T. A. Conrad.

—— **bella** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 289, 290, pl. 46, fig. 38. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

Tubulipora megaera n. s. Lonsdale. (1844).
Quart. Jour. Geol. Soc., London, vol. 1, pp. 69, 70, figs. *a*, *b*, p. 69. London, 1845. William Lonsdale.
Formation: Cretaceous.
Location: Timber creek, N. J.

Tubulostium dickhauti White. (1881.)
Proc. U. S. Nat. Mus., vol. 4, p. 138, pl. 1, figs. 12, 13. Wash., 1881. Smithson. Misc. Coll., vol. 22. Wash., 1882. C. A. White.

Tulotoma (Haldeman) White. (1876.)
Rep. Geol. Uinta Mts., p. 134. Wash., 1876. C. A. White.

—— **thompsoni** n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 134. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous].
Location: [Southern Wyoming, west of the Rocky mountains, and also east of the same in Colorado.]

—— **thompsoni** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 172. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, Colo.

—— **thompsoni** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Terr., p. 221. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

Tulotoma—Continued.

—— **thompsoni** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., Part 1, pp. 100, 101, pl. 28, figs. 2*a*–*h*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.; also in the valley of Crow creek, east of the Rocky mountains in Colorado.

—— **thompsoni** White. (1883.)
Third Ann. Rep. U. S. Geol. and Geogr. Sur., p. 467, pl. 24, figs. 17–22. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Northern Colorado, east of the Rocky mountains; Southern Wyoming, west of the Rocky mountains.

Turbinella (Lam.) Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 94. Phila., 1861. W. M. Gabb.

—— **crassitesta** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 157, 158, pl. 26, fig. 37. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— **parva** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 94. pl. 2, fig. 10. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Monmouth county, N. J.

—— **subconica** n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 94, pl. 2, fig. 6. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Monmouth county, N. J.

Turbinolia (Lam.) Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 81. Phila., 1834. S. G. Morton.

—— **inauris** n. s. Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 81. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Alabama and New Jersey.

—— **texana** n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 144, pl. 2, figs. 3*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: Between El Paso and Frontera [Tex.].

—— ? **texana** (Con.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 276 Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— (Lam.) Say. (1820.)
Am. Jour. Sci., 1st ser., vol. 2, p. 45. New Haven, 1820. Thomas Say.
Formation: [Cretaceous.]
Location: New Jersey.

Turbinopsis n. g. Conrad. (1860.)
Jour. Acad. Nat. Sci. Phila., vol. 4, 2d ser., 1858–1860, p. 289. Phila., 1858–1860. T. A. Conrad.

—— **depressa** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 321. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, N. J., and at the Delaware and Chesapeake canal.

—— **depressa** (Gabb) Conrad. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870. p. 45. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **hilgardi** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci. Phila., vol. 4, 2d ser., 1858–1860, p. 289, pl. 46, fig. 29. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— **hilgardi** (Con.) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 300. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey, Delaware, Alabama, and Mississippi.

Turbo [Linn] Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 9. Phila., 1870. W. M. Gabb.

—— ? **elevatus** n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, pp. 9, 10, pl. 3, fig. 5. Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Volcano about thirty miles southeast of Walker's lake, Nev.

—— **mudgeanus** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 313. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

—— **nebrascensis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 64. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Yellowstone river, one hundred and fifty miles from mouth, Nebr.

—— ? **regius** n. s. Gabb. (1869.)
Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 9, pl. 5, fig. 4. Phila., 1870. W. M. Gabb.
Formation: Jurassic.
Location: Volcano, about thirty miles southeast of Walker's lake, Nev.

—— **tenuilineatus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, pp. 64, 65. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau trading post, Nebr.

—— (Lam.) Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 122. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

Turbonilla [Risso] Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 287. Phila., 1858. T. A. Conrad.

—— (**Chemnitzia**?) **coalvillensis** n. s. Meek. (1873.)
Sixth Ann. Rep. Geol. and Geogr. Sur. Terr., pp. 505, 506. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (**Chemnitzia**?) **coalvillensis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (**Chemnitzia**?) **coalvillensis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 250. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyo.

—— (**Chemnitzia**) **coalvillensis** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 305, 306, pl. 9, figs. 5a, b. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (**Chemnitzia**) **corona** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 287, pl. 46, fig. 50. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— (**Chemnitzia**) **melanopsis** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 287, 288, pl. 46, fig. 35. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— (**Chemnitzia**) **melanopsis** (Con. ?) White. (1875.)
Rep. Geogr. and Geol. Expl. and Sur. west of one-hundredth meridian, vol. 4, pt. 1, pp. 197, 198, pl. 18, fig. 10a. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Near the west crossing of Virgin river, Utah.

—— (**Chemnitzia**) **spillmani** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 287, pl. 46, fig. 48. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

Turnus n. g. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 145, 146. Phila., 1864. W. M. Gabb.

Turnus—Continued.

—— (Gabb) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 254. Wash., 1876. F. B. Meek.

—— **plenus** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 146, pl. 22, fig. 116. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: North fork of Cottonwood creek, Cal.

—— **sphenoideus** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 117, 118. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, Utah.

—— **(Goniochasma) stimpsoni** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 256, 257, pl. 30, figs. 9*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Muscle Shell river, Idaho.

—— **(Xylophagella) contortus** Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 304. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— **(Xylophagella) elegantulus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 257, 258, pl. 30, fig. 10*a–e*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Muscle Shell river, Idaho.

Turrilites [Lam.] Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 284. Phila., 1858–1860. T. A. Conrad.

—— **alternatus** n. s. Tuomey. (1854.)
Proc. Acad. Nat. Sci., Phila., vol. 7, sp. 168, 169. Phila., 1856. M. Tuomey.
Formation: Cretaceous.
Location: Noxubie county, Miss.

—— **brazoensis** n. s. Roemer. (1849.)
Texas, p. 415. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Thirty miles above Torrey's trading house on Brazos river, Tex.

—— **brazoensis** Roemer. (1852.)
Kreide. von Texas, p. 37, Taf. 3, fig. 2. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Left bank of Brazos river, thirty miles above Torrey's trading house.

—— **helicinus** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 191, 192. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point and Corsicana, Navarro county, Tex.

—— **oregonensis** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 138. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Crooked creek of the Des Chutes, Oregon.

Turrilites—Continued.

—— **spinifera** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 284. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **splendens** n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 191. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Chatfield point and near Corsicana, Navarro county, Tex.

—— ? **umbilicatus** n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, p. 56. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Great bend of the Missouri.

—— **(Helicoceras) cochleatus** n. s. M. & H.) (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, p. 55, 56. Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Great bend of the Missouri.

—— **sp. undet.** Owen. (1860.)
Second Rep. Geol. Rec. Ark., pl. 8, fig. 2. Phila., 1860. D. D. Owen.
Formation: Cretaceous.
Location: Arkansas.

—— **sp. undet.** Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 73, pl. 20, fig. 201. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Jacksonville, Oregon.

Turris (Bolton) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 381. Wash., 1876. F. B. Meek.

—— **claytonensis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 92, 93, pl. 18, fig. 46. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Above the "Clark" or upper coal vein, near Clayton, Contra Costa county, Cal.

—— **minor** (E. & S.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 384, 385, pl. 31, figs. 9*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, Mont., one hundred and fifty miles from its mouth.

—— **ripleyana** n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332, pl. 35, figs. 21, 29. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **(Rumphius)** Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 332. Phila., 1855–1858. T. A. Conrad.

Turris—Continued.

—— **(Drillia) varicostata** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 93, pl. 18, fig. 47. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Near Clayton, Contra Costa county, Cal.

—— **(Surcula) ? contortus** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 385, 386, pl. 31, figs. 7*a–c;* fig. 49, p. 385. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Moreau river, Dak.

—— **(Surcula) ? hitzi** n. s. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 386–388, fig. 50, p. 387. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Opposite Fort Shea, on the Upper Missouri.

Turritella [Lam.] Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 47, Phila., 1834. S. G. Morton.

—— **altilis** n. s. Conrad. (1858.)

Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333. Phila., 1855–1858. T. A. Conrad.

Formation: Cretaceous.

Location: Owl creek, three miles north of the town of Ripley, Miss.

—— **chicoensis** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 133, 134, pl. 21, fig. 91. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Chico creek, Butte county, Cal.

—— **coalvillensis** n. s. Meek. (1873.)

Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 502, 503. Wash., 1873. F. B. Meek.

Formation: Cretaceous.

Location: Coalville, Utah.

—— **coalvillensis** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

—— **coalvillensis** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 315, 316, pl. 9, fig. 4*a*. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Coalville, Utah.

—— **convexa** n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., for 1856, p. 70. Phila., 1857. Meek & Hayden.

Formation: Cretaceous.

Location: Yellowstone river, one hundred and fifty miles from mouth, Nebr.

—— **corsicana** n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 196. Boston, 1862. B. F. Shumard.

Formation: Cretaceous.

Location: Near Corsicana and Chatfield point, Navarro county, Tex.

Turritella—Continued.

—— **encrinoides** n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 47, pl. 3, fig. 7. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey and Alabama.

—— **encrinoides** (Morton) Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 301. Phila., 1876. W. M. Gabb.

Formation: Cretaceous.

Location: Pataula creek, Ga.

—— **fastigiata** n. s. Tuomey. (1854.)

Proc. Acad. Nat. Sci., Phila., vol. 7, p. 169. Phila., 1856. M. Tuomey.

Formation: Cretaceous.

Location: Noxubie county, Mississippi.

—— **granulicosta** n. s. Gabb. (1861.)

Proc. Acad. Nat. Sci., Phila., for 1861, p. 363. Phila., 1862. W. M. Gabb.

Formation: Cretaceous.

Location: Burlington county, N. J.

—— **hardemanensis** n. s. Gabb. (1860.)

Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 392, pl. 68, figs. 15. Phila., 1858–1860. W. M. Gabb.

Formation: Cretaceous.

Location: Hardeman county, Tenn.

—— **inbricataria** n. s. Troost. (1840.)

Fifth Geol. Rep. Tenn., p. 56. Nashville, 1840. G. Troost.

Formation: Cretaceous.

Location: Near Purdy, McNairy county, Tenn.

—— **infralineata** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 131, 132, pl. 20, fig. 87. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: North fork of Cottonwood creek, Shasta county; Orestimba canyon, Stanislaus county, Cal.

—— **irrorata** n. s. Conrad. (1855.)

Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 268. Phila., 1856. T. A. Conrad.

Formation: Cretaceous.

Location: Between El Paso and Frontera ? [Tex.].

—— **kansasensis** n. s. Meek. (1871.)

Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 312, 313. Wash., 1871. F. B. Meek.

Formation: Cretaceous.

Location: Twelve miles southwest of Salina, Kans.

—— **leonensis** n. s. Conrad. (1857.)

Rep. U. S. and Mex. Bound. Sur., vol. 1, pt. 2, p. 165, pl. 21, figs. 7*a*, *b*. Wash., 1857. T. A. Conrad.

Formation: Cretaceous.

Location: [Texas.]

—— **marnochi** n. s. White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 314, 315, pl. 7, figs. 5*a*, *b*. Wash., 1879. C. A. White.

Formation: Cretaceous.

Location: Vicinity of Helotes, Bexar county, Tex.

Turritella—Continued.

—— martinezensis n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, pp. 169, 170, pl. 28, fig. 51. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

—— moreauensis n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 70. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Moreau river, Nebr.

—— multilineata n. s. E. & S.• (1857.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, pp. 41, 42. St. Louis, 1856, 1860. Evans & Shumard.
Formation: Cretaceous.
Location: Moreau and Grand rivers.

—— planilateris n. s. Conrad. (1857.)
Rep. U. S. and Mex. Bound. Sur., vol. 1. pt. 2, p. 158, pl. 14, fig. 1*a*, *b*. Wash., 1857. T. A. Conrad.
Formation: Cretaceous.
Location: [Texas.]

—— pumila n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 392, pl. 68, fig. 14. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tenn.

—— robusta n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont, vol. 1, pp. 135, 136, pl. 21, fig. 94. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

—— saffordi n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 392, pl. 68, fig. 11. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tenn.

—— saffordii Gabb. (1864.)
Geol. Sur. Cal. Paleont, vol. 1, p. 135, pl. 21, fig. 93. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Six miles northeast of Suisun, Solano county; south of Clear lake, Lake county; near Martinez, Cal.

—— secta n. s. Conrad. (1855.)
Proc. Acad. Nat. Sci., Phila., for 1854, 1855, p. 268. Phila., 1856. T. A. Conrad.
Formation: Miocene [Cretaceous ?].
Location: Near Mullica Hill, N. J.

—— seriatim-granulata n. s. Roemer. (1849.)
Texas, pp. 413, 414, Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— seriatim-granulata Roemer. (1852.)
Kreide, von Texas, p. 39, Taf. 4, figs. 12*a*, *b*. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

Turritella—Continued.

—— seriatim-granulata (Roem.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 132, 133, pl. 20, fig. 88. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs; Cottonwood creek, Shasta county; Siskiyou mountains, Siskiyou county, Cal.

—— seriatim-granulata (Roem.) Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 263. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— spironema n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 503, 504. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— spironema (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— spironema (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 31, 32, pl. 12, fig. 3*a*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— tennesseensis n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 392, pl. 68, fig. 13. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tenn.

—— tippana n. s. Conrad.
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855–1858, p. 333, pl. 35, fig. 19. Phila., 1855–1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— tippana Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 285. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— trilira n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci. Phila., vol. 4, 2d ser., 1858–1860, p. 285. Phila., 1858–1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

—— veatchii n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 133, pl. 20, fig. 90. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Tehama county, Cal.

Turritella—Continued.

—— vertebroides n. s. Morton. (1834.)

Synop. Org. Rem. Cret. Gr. U. S., p. 47, pl. 3, fig. 13. Phila., 1834. S. G. Morton.

Formation: Cretaceous.

Location: New Jersey and Alabama.

—— uvasana n. s. Conrad. (1855.)

Rep. Expl. and Sur. R. R. R. Mississippi River to Pacific Ocean, App. Prelim. Geol. Rep. of W. P. Blake, Pal., pp. 10, 11. Wash., 1855. T. A. Conrad.

Formation: Eocene [Cretaceous].

Location: Cañada de las Uvas.

—— uvasana Conrad. (1856.)

Rep. Expl. and Sur. R. R. R. Mississippi River to Pacific Ocean, vol. 5, App., pp. 321, 322, pl. 2, fig. 12. Wash., 1856. T. A. Conrad.

Formation: Eocene [Cretaceous].

Location: Cañada de las Uvas.

—— uvasana (Con.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 134, pl. 21, fig. 22. Phila., 1864. W. M. Gabb.

Formation: Cretaceous.

Location: Hills from Bull's Head point to Clayton, Contra Costa county; east of the mouth of the Canada de las Uvas, Los Angeles county, near Martinez, Cal.

—— uvasana (Con.) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur., west of One-hundredth Meridian, vol. 4, pt. 1, p. 195, pl. 18, figs. 11*a*, *b*. Wash., 1875. C. A. White.

Formation: Cretaceous.

Location: Southeast of Paria, Utah.

—— winchelli n. s. Shumard. (1861.)

Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, pp. 196, 197. Boston, 1862. B. F. Shumard.

Formation: Cretaceous.

Location: Near Corsicana and Chatfield point, Navarro county, Texas.

—— (Aclis ?) micronema (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.

Formation : Cretaceous.

Location : Coalville, Utah.

—— (Aclis ?) micronema (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 316, pl. 9, fig. 8*a*. Wash., 1879. C. A. White.

Formation : Cretaceous.

Location: Coalville, Utah.

—— [Lam.] Say. (1820.)

Am. Jour. Sci., 1st ser., vol. 2, p. 44. New Haven, 1820. Thomas Say.

Formation: Cretaceous.

Location: New Jersey.

—— sp. undet. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 281. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: Deep cut of the Chesapeake and Delaware canal.

Turritella—Continued.

—— sp. undet. Morton. (1830.)

Am. Jour. Sci., 1st ser., vol. 17, p. 281. New Haven, 1830. S. G. Morton.

Formation: Cretaceous.

Location: [New Jersey ?]

—— sp. undet. Roemer. (1849.)

Texas, p. 414. Bonn, 1849. F. Roemer.

Formation: Cretaceous.

Location: Ford near New Braunfels, Tex.

—— sp. undet. Roemer. (1852.)

Kreide. von Texas, p. 39. Bonn, 1852. F. Roemer.

Formation: Cretaceous.

Location: Ford of the Guadalupe, New Braunfels, Tex.

—— sp. undet. Credner. (1870.)

Zeitsch. Deutsch. Geol. Ges., Band 22, p. 257. Berlin, 1870. H. Credner.

Formation: Cretaceous.

Location: New Jersey.

Tylostoma (Sharpe) Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, p. 261. Phila., 1869. W. M. Gabb.

—— mutabilis n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 261, 262, pl. 35, fig. 6, *a–c*. Phila., 1869. W. M. Gabb.

Formation: Cretaceous.

Location: Sierra de las Conchas, near Arivechi, Sonora, Mexico.

—— princeps n. s. White. (1880.)

Proc. U. S. Nat. Mus., vol. 3, pp. 140–142, pl. 2, figs. 1, 2. Wash., 1881. C. A. White.

Formation: Cretaceous.

Location: Zapotitlan salt works, about six miles southwestward from the town of Tehuacan, in the state of Pueblo, Mexico, and about fifteen miles inland from the gulf coast.

—— princeps White. (1884.)

La Naturaleza, Tomo 6, pp. 219–221, figs. 6, 7. Mexico, 1884. C. A. White.

Typhis (Montf.) Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 82. Phila., 1864. W. M. Gabb.

—— antiquus n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 82, pl. 18, fig. 31, Phila., 1864. W. M. Gabb.

Formation : Cretaceous.

Location: Bull's Head point, northeast of Martinez, Cal.

Uintacrinus n. g. Grinnell. (1876.)

Am. Jour. Sci., 3d ser., vol. 12, p. 81. New Haven, 1876. G. B. Grinnell.

—— socialis n. s. Grinnell. (1876.)

Am. Jour. Sci., 3d ser., vol. 12, pp. 81–83, pl. 4. New Haven, 1876. G. B. Grinnell.

Formation: Cretaceous.

Location: Uinta mountains and Kansas.

—— socialis (Grinnell) Meek. (1876.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 2, No. 4, pp. 375–378, figs. A and B text. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Trego county, Kans.

Unicardium (d'Orb.) Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 50. Phila., 1864. F. B. Meek.

—— ? gibbosum n. s. Meek. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 50, 51, pl. 8, figs. 8, 8a. Phila., 1864. F. B. Meek.
Formation: Jurassic.
Location: Genesee valley, Plumas county, Cal.

Unio (Retzius) Meek. (1860.)
Rep. Expl. Great Basin Terr. Utah, p. 361. Wash., 1876. F. B. Meek.

—— alatoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 164, Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

—— alatoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 249, 250, pl. 33, figs. 3, 4,; pl. 34, fig. 6. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

—— albertensis n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can., Paleont., vol. 1, pt. 1, p. 3, pl. 1, fig. 1. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Upper Belly river, Alberta, Northwest Territory, seven miles above the mouth of the Old Man river, Canada.

—— aldrichi n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 710, 711. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Union Pacific railroad, Wyo.

—— aldrichi White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— aldrichi White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 62, 63, pl. 29, figs. 2a, b. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, station, Wyo.

—— aldrichi White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 15, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, Wyo.

—— belliplicatus n. s. Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 430. Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Limestone hill, Bear river.

—— belliplicatus Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 165–167, pl. 16, figs. 4, 4a. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Limestone hill, on Bear river, Utah; Gilmer, Wyo.

Unio—Continued.

—— belliplicatus (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— belliplicatus (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 71. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, both above and below Evanston, Wyo.

—— belliplicatus (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 430, pl. 6, figs. 1–3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— brachyopisthus n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 126. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous].
Location: Black buttes, Wyo.

—— brachiopisthus White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— brachyopisthus White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 64, pl. 22, figs. 2a, b. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— brachyopisthus White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 16, figs. 7, 8. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— carriosoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 163. Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

—— cariosoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 247, pl. 32, fig. 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

—— consuetus n. s.? Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 59–61; pl. 9, figs. 4, 4a. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Milk River ridge, Red Deer river, township 21, range 12, west of fourth principal meridian, Canada.

—— couesi White. (1879.) *
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

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* See Bull. U. S. Geol. and Geogr. Sur. Terr., vol. III, p. 605. Wash., 1877.

Unio—Continued.

—— couesi White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 64, 65, pl. 27, fig. 1a. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— couesii White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 432, pl. 16, fig. 1. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, Wyo.

—— cristonensis n. s. Meek. (1875.)
Ann. Rep. U. S. Geogr. Expl. and Sur. West 100th Meridian for 1875, p. 83. Wash. 1875. F. B. Meek.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

—— cristonensis (Meek) Cope. (1877.)
U. S. Geog. Sur. West 100th Meridian, vol. 4, pt. 2, p. 9, pl. 23, figs. 2–5. Wash. 1877. E. D. Cope.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

—— cristonensis (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 425, pl. 3, fig. 5. Wash., 1883. C. A. White.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

—— cryptorhynchus n. s. White. (1877.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. 3, p. 600. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Dog creek, a tributary of the Upper Missouri river, Montana.

—— cryptorhynchus White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 218, 219. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— cryptorhynchus White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 68, 69, pl. 24. figs. 1a, b. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Dog creek, a tributary of the upper Missouri river.

—— cryptorhynchus White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 431, pl. 14, figs. 6, 7. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Judith river beds.

—— danæ (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 517, 518, pl. 41, figs. 3, *a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Judith river.

—— danæ (M. & H.?) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 219. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— danæ (M. & H.?) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 68, pl. 27, figs. 2a, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— danæ (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 431, pl. 17, figs. 1–3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— danæ (M. & H.?) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 18, figs. 1, 2. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— danæ (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 6. Montreal, 1885. J. F. Whiteaves.
Formation: Laramie.
Location: Bow river, mouth of East Arrowwood creek, also Bow river, four and eight miles west of Blackfoot crossing; Belly river west of crossing of MacLeod-Benton trail; Pincher creek; Knee Hills creek, township 29, range 22 west of fourth principal meridian, Canada.

—— danæ (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 59. Montreal 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South shore of the Belly river, above Coal banks, Canada.

—— danæ (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 65. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, northwest angle of Driftwood bend, Canada.

—— danai n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 145. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr. [Mont.]

—— deweyanus n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, pp. 145, 146. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr. [Mont.]

—— deweyanus (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 519, pl. 41, figs. 2a–c. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— deweyanus (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 71. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

Unio—Continued.

—— **deweyanus** (M. & H.) White. (1883)

Third Ann. Rep. U. S. Geol. Sur., p. 431, pl. 17, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Judith river beds.

—— **deweyanus** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 66. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, one mile below the mouth of the Bow river, Canada.

—— **endlichi** n. s. White. (1877.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. 3, pp. 604, 605. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— **endlichi** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— **endlichi** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 66, 67, pl. 26, fig. 1*a*, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— **endlichi** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 432, pl. 15, figs. 1, 2. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— **felchii** n. s. White. (1886.)

Bull. U. S. Geol. Sur., No. 29, p. 16, pl. 1, figs. 1–5. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

—— **gallinensis** n. s. Meek. (1875.)

Ann. Rep. U. S. Geogr. Expl. and Sur. West 100th Meridian for 1875, p. 84. Wash. 1875. F. B. Meek.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

—— **gallinensis** (Meek) Cope. (1877.)

U. S. Geog. Sur. West 100th Meridian, vol. 4, pt. 2, p. 9, pl. 23, figs. 6, 6*a*. Wash. 1877. E. D. Cope.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

—— **goniambonatus** n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 709, 710. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Union Pacific railroad, Wyo.

Unio—Continued.

—— **goniambonatus** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— **goniambonatus** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 63, 64, pl. 29, figs. 1*a*, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— **goniambonatus** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 19, figs. 3, 4. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— **gonibonotus** n. s. White. (1876.)

Rep. Geol. Uinta Mts., pp. 116, 117. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, Utah.

—— **gonionotus** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geog. Sur. Terr., Part 1, pp. 71, 72, pl. 26, figs. 2*a*–*e*. Wash. 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Kanab, southern Utah.

—— **gonionotus** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 13, figs. 7–10. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southern Utah.

—— **holmesianus** n. s. White. (1877.)

Bull. U. S. Geol. and Geogr. Sur., Terr., vol. 3, No. 3, p. 604, Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

—— **holmesianus** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur., Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— **holmesianus** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr. pt. 1, pp. 67, 68, pl. 22, figs. 4*a*–*e*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black buttes station, Wyo.

—— **holmesianus** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 16, figs. 2–6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, Wyo.

—— **hubbardii** n. s. Gabb. (1869.)

Geol. Sur. Cal. Paleont., vol. 2, pp. 190, 191, pl. 30, fig. 86. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Nanaimo coal mine, Vancouver island.

Unio—Continued.

——hubbardi (Gabb) Whiteaves. (1876.)
Geol. Sur. Can. Mes. Foss., vol. 1, pt. 1, pp. 65–68, pl. 9, fig. 13. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

——hubbardi (Gabb) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 427, pl. 5, figs. 2, 3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Vancouver island.

——hubbardi (Gabb) Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can. Mes. Fos. vol. 1, pt. 3, p. 230. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: Hooper's creek, or King's tunnel, Cowgitz' coal mine.

——humerosoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, pp. 163, 164. Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

——humerosoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 284, pl. 31, fig. 4. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

——iridoides n. s. White. (1886.)
Bull. U. S. Geol. Sur. No. 29, pp. 17, 18, pl. 2, figs. 3, 4. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

——lapilloides n. s. White. (1886.)
Bull. U. S. Geol. Sur. No. 29, p. 18, pl. 2, figs. 5, 6. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.; Como, Wyo.

——ligamentinoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 164. Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location; About six miles northeast of Camden, N. J.

——ligamentinoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 249, pl. 32, fig. 4; pl. 34, fig. 8. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

——macropisthus n. s. White. (1886.)
Bull. U. S. Geol. Sur. No. 29, p. 17, pl. 2, fig. 7. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

——martini (d'Orb) Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, pp. 168, 169, Taf. 16, figs. 28, 29. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

Unio—Continued.

——mendax n. s. White. (1877.)
Bull. U. S. Geol. and Geogr. Sur., Terr., vol. No. 3, pp. 605, 606. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Wales, Utah; also canyon of Desolation of Green river, Utah.

——mendax White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 18, figs. 3–5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Canyon of Desolation, and Wales, Utah.

——nasutoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 1 Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

——nasutoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 244, 245, pl. 34, figs. 4, 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

——nucalis n. s. M. & H. (1858.)
Proc. Acad. Nat. Sci., Phila., for 1858, p. 52 Phila., 1859. Meek & Hayden.
Formation: Cretaceous.
Location: Southwest base of Black hills.

——nucalis M. & H. (1865.)
Paleont. Upper Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 92, 93, pl. 3, figs. 1 Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills.

——nucalis M & H. White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 426, pl. 3, figs. 2–4. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Vicinity of Black hills.

——nucalis M. & H. White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 19, pl. 3, figs. 3–7. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Como, Wyo.; Black hills, Dak.

——penultimus n. s. Gabb. (1864).
Geol. Sur. Cal. Paleont., vol. 1, pp. 182, 183, pl. 24, fig. 164. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Peacock coal mine, Mount Diablo, Contra Costa county, Cal.

——penultimus (Gabb) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 427, pl. 5, fig. 1. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: California.

——petrinus n. s. White. (1876.)
Rep. Geol. Uinta Mt., p. 125. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

Unio—Continued.

——**præanodontoides** n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, p. 250, pl. 31, fig. 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

——**primævus** n. s. White. (1877.)
Bull. U. S. Geol. and Geogr. Sur., Terr., vol. 3, No. 3, pp. 599, 600. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: South of Cow island, Upper Missouri river, Mont.

——**primævus** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr, pt. 1, p. 70, pl. 29, figs. 3*a*, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: South of Cow island, Upper Missouri river, Mont.

——**primævus** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 432, pl. 14, figs. 4, 5. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Judith river beds.

——**primævus** (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can. Cont. Can. Paleont., vol. 1, pt. 1, p. 59. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Branch of East fork of Milk river, township 1, range 27, west of third principal meridian, Canada.

——**priscus** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 117. Phila., 1857. Meek & Hayden.
Formation; Tertiary [Cretaceous].
Location: Yellowstone river, forty miles above the mouth.

——**priscus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 516, 517, pl. 43, figs. 8*a*–*d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On Yellowstone river, forty miles above its mouth; near mouth of Judith river, Mont.

——**priscus** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr. pt. 1, p. 70. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Valley of the Yellowstone river.

——**priscus** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 432, pl. 14, fig. 1. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

——**priscus** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 26, 27. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Wood End depot, Souris river, Canada.

Unio—Continued.

——**priscus** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 65, pl. 10, fig. 3. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Belly river, two miles above Woodpecker island, Canada.

——**proavitus** n. s. White. (1877.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 3, No. 3, pp. 603, 604. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, Wyo.

——**proavitus** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

——**proavitus** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 65, 66, pl. 22, figs. 3*a*–*d*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

——**proavitus** White. (1883.)
Third Ann. Rep. U. S. Geol. and Geogr. Sur., p. 433, pl. 13, figs. 3–6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black Buttes, Wyo.

——**propheticus** n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 125, 126. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous].
Location: Black buttes, Wyo.

——**phopheticus** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

——**propheticus** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur., Terr., pt. 1, p. 65, pl. 22. fig. 5*a*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

——**propheticus** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 433, pl. 15, fig. 3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Black buttes, Wyo.

——**radiatoides** n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 163. Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

——**radiatoides** (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 245, 246, pl. 34, figs. 1–3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

Unio—Continued.

—— rectoides n. s. Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 250, 251, pl. 32, figs. 1, 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

—— roanokoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 164. Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

—— roanokoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 248, 249, pl. 33, figs. 1, 2; pl. 34, fig. 7. Wash., 1885. R. P Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

—— senectus n. s. White. (1877.)
Bull. U. S. Geol and Geogr. Sur. Terr., vol. 3, No. 3, pp. 600, 601. Wash., 1877. C. A. White.
Formation: Cretaceous.
Location: Dog creek, a tributary of the Upper Missouri river, Mont.

—— senectus White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 69, pl. 28, figs. 1a–c. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Valley of Dog creek, a tributary of the Upper Missouri river.

—— senectus White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 432, pl. 19, figs. 1, 2. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Judith river beds.

—— senectus (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 6, 7. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bow river, two miles below the mouth of Jumping Pound river, Canada.

—— senectus (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 67, pl. 10, fig. 2. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, one mile below the mouth of the Bow river, Canada.

—— stewardi n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 110. Wash., 1876. C. A. White.
Formation: Jurassic.
Location: Flaming gorge of Green river, near the northern boundary line of Utah.

Unio—Continued.

—— stewardi White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 426, pl. 3, fig. 1. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Northern Utah.

—— stewardi White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 19, pl. 3, figs. 1, 2. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo., near banks of Green river, southern Wyoming.

—— subrotundoides n. s. Lea. (1868.)
Proc. Acad. Nat. Sci., Phila., for 1868, p. 163. Phila., 1868. Isaac Lea.
Formation: Cretaceous.
Location: About six miles northeast of Camden, N. J.

—— subrotundoides (Lea) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 246, 247, pl. 32, fig. 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Fish house, Camden county, N. J.

—— subspatulata n. s. M. & H. (1857.)
Proc. Acad. Nat. Sci., Phila., for 1857, p. 146. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr. [Mont.]

—— subspatulatus (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 518, 519, pl. 41, figs. 1*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— subspatulatus (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 71. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— subspatulatus (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 432, pl. 14, figs. 2, 3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Judith river beds.

—— supragibbosus n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can.; Cont. Can. Paleont., vol. 1, pt. 1, pp. 66, 67, pl. 10, fig. 1. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, one mile below the mouth of the Bow river, Canada.

—— terræ-rubræ n. s. Meek. (1875.)
Ann. Rep. U. S. Geogr. Expl. and Sur. west one-hundredth meridian for 1875, p. 84. Wash., 1875. F. B. Meek.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

Unio—Continued.

—— **terræ-rubræ** (Meek) Cope. (1877.)
U. S. Geogr. Sur. west one-hundredth meridian, vol. 4, pt. 2, p. 9, pl. 23, figs. 7, 7*a*. Wash., 1877. E. D. Cope.
Formation: Triassic.
Location: Gallinas creek, N. Mex.

—— **toxonotus** n. s. White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 17, pl. 2, figs. 1, 2. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.

—— **vetusta** n. s. Meek. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 312. Phila., 1861. F. B. Meek.
Formation: Cretaceous.
Location: Bear river, near the mouth of Sulphur creek, latitude 41° 12′ north, longitude 110° 52′ west.

—— **vetustus** Meek. (1870.)
Proc. Am. Philos. Soc., vol. 11, 1869, 1870, p. 430. Phila., 1871. F. B. Meek.
Formation: Tertiary [Cretaceous].
Location: Limestone hill, Bear river.

—— **vetustus** Meek. (1876.)
Rep. Expl. Great Basin Terr. Utah, p. 361, pl. 5, figs. 12, *a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Bear river, near the mouth of Sulphur creek.

—— **vetustus** Meek. (1877.)
Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 164, 165, pl. 17, figs. 5, *a–c*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Bear river, near the mouth of Sulphur creek, Wyo.

—— **vetustus** (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **vetustus** (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 71. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, both above and below Evanston, Wyo.

—— **vetustus** (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 430, pl. 7, figs. 1–4. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

—— (**Baphia** ?) **nebrascensis** n. s. Meek. (1871.)
Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 303. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Opposite Sioux city, on the Missouri, in Dakota county, Nebr,

Unio—Continued.

—— **sp. undet.** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 168. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow creek, Colo.

—— **sp. undet.** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

Unionopsis (subgen. Swainson) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 113. Wash., 1876. F. B. Meek.

Urosyca n. g. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2. p. 159. Phila., 1869. W. M. Gabb.

—— **caudata** n. s. Gabb. (1869.)
Geol. Sur. Cal. Paleont., vol. 2, p. 159, pl. 27, fig. 38. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: Martinez, Cal.

Vaginulina calcipara Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 7. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **cretæ** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 8. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

—— **subacuta** Ehrenberg. (1854.)
Mikrogeologie, Taf. 32, fig. 9. Leipzig, 1854. C. G. Ehrenberg.
Formation: Cretaceous.
Location: Mississippi region.

Valvata (Müller) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 112, 113. Wash., 1865. Meek & Hayden.

—— (Müller) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 590. Wash., 1876. F. B. Meek.

—— **bicincta** n. s. Whiteaves.
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, pp. 25, 26, pl. 3, figs. 3, 8, 8*a*, *b*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Mouth of Blind Man river, township 39, range 27, west of fourth principal meridian, Canada.

—— **filosa** n. s. Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 25, pl. 3, figs. 7, 7*a*. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Pincher creek, mouth of the Blind Man river, township 39, range 27, west of fourth principal meridian, Canada.

Valvata—Continued.

——? montanaensis n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 591, 592, figs. 81–83, p. 591. Wash., 1876. F. B. Meek.
Formation: Cretaceous?
Location: Mouth of Judith river, on the Upper Missouri, Mont.

——? montanaensis (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 102. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

——? montanaensis (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 470, pl. 27, fig. 24. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— nana n. s. Meek. (1873.)
Sixth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 507. Wash., 1873. F. B. Meek.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— nana (Meek) White. (1879.)
Eleventh Ann. Rep. U. S. Geol and Geogr. Sur. Terr., p. 238. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— nana (Meek) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 33, 34, pl. 12, figs. 17*a*, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Carleton's coal mine, Coalville, Utah.

—— nana (Meek) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 470, pl. 5, figs. 19, 20. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— parvula n. s. M. &. H. (1856.)
Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 123. Phila., 1857. Meek & Hayden.
Formation: Tertiary [Cretaceous].
Location: Three miles below Fort Union.

—— parvula (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 591. Wash., 1876. F. B. Meek.
Formation: [Cretaceous.]
Location: Three miles below Fort Union, Dak.

—— parvula (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 102. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— scabrida (M. & H. ?) White. (1886.)
Bull. U. S. Geol. Sur. No. 29, p. 22, pl. 4, figs. 1–3, 19. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Eight miles north of Canyon city, Colo.; also Black hills of Dakota.

Valvata—Continued.

—— scabrida (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 470, pl. 3, fig. 7. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Vicinity of the Black hills.

—— subumbilicata (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 590, 591, pl. 43, figs. 13*a–c*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous.]
Location: Three miles below Fort Union, Dak.

—— subumbilicata (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 102. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— subumbilicata (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 470, pl. 27, fig. 25. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— ? (Tropidina scabrida n. s. M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 113, pl. 4, figs. 2, *a*, *b*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Near southwest base of Black hills.

Vanikoro (Quoy & Gaim) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 329. Wash., 1876. F. B. Meek.

—— ambigua (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 330, 331, pl. 19, figs. 12*a–d*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river, 150 miles above its mouth.

—— ambigua (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 430, 431, pl. 12, fig. 14. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, Black hills.

—— pulchella nom. prov. Whiteaves. (1884.)
Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, pp. 215, 216, pl. 27, figs. 4, 4*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: East end of Maud island, opposite Leading island.

Vanikoropsis n. g. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 331. Wash., 1876. F. B. Meek.

—— suciensis n. s. White. (1889.)
Bull. U. S. Geol. Sur. No. 51, p. 46, pl. 7, fig. 4. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Sucia Island.

Vanikoropsis—Continued.

—— **tuomeyana** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 332, pl. 39, figs. 2a, b. Wash., 1876. F. B. Meek.

Formation: Cretaceous.

Location: Mouth of Judith river, on the Upper Missouri.

—— **tuomeyana** (M. & H.) Whitfield. 1876.)

Rep. Rec. Carroll, Mont., to Yellowstone National Park, p. 145, pl. 2, figs. 11-13. Wash., 1876. R. P. Whitfield.

Formation: Cretaceous.

Location: Near the mouth of Judith river, Mont.

—— **tuomeyana** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 49. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Three miles north of Ross coulée, near Irvine station, on the Canadian Pacific railway, Canada.

Vasculum n. g. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 16. Wash., 1889. C. A. White.

—— **obliquum** n. s. White. (1889.)

Bull. U. S. Geol. Sur. No. 51, p. 16, pl. 4, figs. 19-21. Wash., 1889. C. A. White.

Formation: Cretaceous.

Location: Canyon of Chico creek, fifteen miles east of Chico, Butte county, Cal.

Velatella (subgen. Meek) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of One-hundredth Meridian, vol. 4, pt. 1, p. 189. Wash., 1875. C. A. White.

—— **baptista** (White) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 73. Montreal, 1885. J. F. Whiteaves.

Formation: Cretaceous.

Location: Coulée "about fourteen miles northeastward from the most eastern of the Three Buttes," near the forty-ninth parallel; Belly river, east side of Driftwood bend, and Belly river, near its junction with the Bow river; south side of Milk river, one mile above the mouth of Pà-kow-ki coulée; South Saskatchewan, one mile below the mouth of the Bow river, Canada.

Veleda n. g. Conrad. (1870.)

Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 74. Phila., 1871. T. A. Conrad.

—— **lintea** n. s. Conrad. (1870.)

Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 74. Phila., 1871. T. A. Conrad.

Formation: Cretaceous.

—— **lintea** Conrad. (1875.)

Rep. Geol. Sur. N. C., vol. 1, Raleigh, 1875. W. C. Kerr. App. A, p. 9, pl. 1, fig. 26. T. A. Conrad.

Formation: Cretaceous.

Location: Snow hill, Greene county, N. C.

Veleda—Continued.

—— **lintea** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 172, 173, pl. 23, figs. 18-21. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Rev. G. C. Schanck's pits, near Marlboro, N. J.

—— **nasuta** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 217, pl. 28, fig. 23. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Near New Egypt, N. J.

—— **tellinoides** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 173, 174, pl. 23, fig. 23. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Rev. G. C. Schanck's pits, near Marlboro, Monmouth county, N. J.

—— **transversa** n. s. Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 174, pl. 23, fig. 22. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Marlboro, N. J.

Velletia (Ancylus) minuta n. s. M. & H. (1856.)

Proc. Acad. Nat. Sci., Phila., vol. 8, for 1856, p. 120. Phila., 1857. Meek & Hayden.

Formation: Tertiary [Cretaceous].

Location: Three miles below Fort Union.

Veloritina n. subgen. Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 161. Wash., 1876. F. B. Meek.

Veniella (Stoliczka) White. (1875.)

Rep. Geogr. and Geol. Expl. and Sur. west of One-hundredth Meridian, vol. 4, pt. 1, p. 185. Wash., 1875. C. A. White.

—— (Stoliczka) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 148. Wash., 1876. F. B. Meek.

—— **conradi** (Mort.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 144, 145, pl. 19, figs. 8-10. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Holmdel, and from Rev. G. C. Schanck's pits, near Marlboro, N. J.

—— **crassa** n. s. Whiteaves. (1879.)

Geol. Sur. Can. Mes. Foss., vol. 1, pt. 2, pp. 153, 154, pl. 18, fig. 1. Montreal, 1879. J. F. Whiteaves.

Formation: Cretaceous.

Location: Sucia islands.

—— **decisa** (Mort.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 145-147, pl. 19, figs. 15, 16. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Blue Ball, and at the marl pits of I. Stratton, near Mullica Hill, N. J.

—— **elevata** (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 148, 149, pl. 19, figs. 6, 7. Wash., 1885. R. P. Whitfield.

Formation: Cretaceous.

Location: Haddonfield, N. J.

Veniella—Continued.

—— **goniophora** (Meek ms.) White.
Rep. Geogr. and Geol. Expl. and Sur. west of One-hundredth meridian, vol. 4, pt. 1, p. 185. Wash., 1875. C. A. White.
Formation: Cretaceous.
Location: Southeast of Paria, Utah.

—— **goniophora** n. s. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 152, 153, pl. 4; fig. 4; fig. 12, p. 152. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Missouri river, near Fort Benton.

—— **humilis** (M. & H.) White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 182. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Valleys of the Cache la Poudre and Little Thompson creek, Colo.

—— **humilis** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., p. 414, pl. 10, figs. 7-13. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On the Cheyenne river, near Old Woman fork, Wyo.

—— **inflata** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 147, 148, pl. 19, figs. 4, 5. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **rhomboidea** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 215, 216, pl. 28, figs. 12, 13. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **subovalis** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 150, 151, pl. 19, figs. 1, 2. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **subtumida** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 154, 155, pl. 17, figs. *5a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Yellowstone river.

—— **trapezoidea** (Con.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 151, 152, pl. 19, fig. 3. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Holmdel, N. J.

—— **trigona** (Gabb.) Whitfield. (1885.)
Mon. U. S. Geol. Sur., vol. 9, pp. 149, 150, pl. 19, figs. 11-14. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Boonton, Monmouth county, and Freehold, N. J.

Veniella—Continued.

—— (**Venilicardia** ?) **humilis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 155, 156, pl. 30, figs. *5a-c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On a branch of Cheyenne river, near the Black hills, on Cache la Poudre river, Colo.

Venilia n. g. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 294. New Haven, 1833. S. G. Morton.

—— **conradi** n. s. Morton. (1833.)
Am. Jour. Sci., 1st ser., vol. 23, p. 294, pl. 8, figs. 1, 2. New Haven, 1833. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **conradi** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., p. 67, pl. 8, figs. 1, 2. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: Arneytown, N. J.; Prairie Bluff, Ala.

—— **conradi** (Morton) Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 313. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Pataula creek, Ga.

—— **elevata** n. s. Conrad. (1870.)
Am. Jour. Conch., vol. 6, Phila., 1870, 1871, pp. 74, 75, pl. 1 [3], figs. 7, *7a*. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **mortoni** n. s. M. & H. (1862.)
Proc. Acad. Nat. Sci., Phila., for 1862, pp. 27, 28. Phila., 1863. Meek & Hayden.
Formation: Cretaceous.
Location: Chippewa point, near Fort Benton, on the Missouri river.

—— **quadrata** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 364. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Mississippi.

—— **rhomboidea** n. s. Conrad. (1853.)
Jour. Acad. Nat. Sci., Phila., vol. 2, 2d ser., 1850-1854, p. 275, pl. 24, fig. 7. Phila., 1850-1854. T. A. Conrad.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— **trapezoidea** n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 282, pl. 47, figs. 7. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **trigona** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 324, 325. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Boonton, N. J.

Venilicardia (subgen. Stoliczka) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 149. Wash., 1876. F. B. Meek.

Venus [Linn.] Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860, p. 598. St. Louis, 1856–1860. B. F. Shumard.

—— **? abnormis** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen Inseln, p. 174, Taf. 16, figs. 19, 20. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Alaska.

—— **æquilateralis** n. s. Gabb.
Geol. Sur. Cal. Paleont., vol. 2, p. 184, pl. 30, fig. 76. Phila., 1869. W. M. Gabb.
Formation: Cretaceous.
Location: San Diego, Cal.

—— **circularis** n. s. M. & H. (1856.)
Proc. Acad. Nat. Sci., Phila., for 1856, p. 272. Phila., 1857. Meek & Hayden.
Formation: Cretaceous.
Location: Just above the mouth of Milk river, Nebr.

—— **costato-squamosa** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen, Inseln, pp. 130, 131. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Kodiak island, Alaska.

—— **lenticularis** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 162, pl. 30, fig. 246. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Benicia, Cal.

—— **meekana** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, p. 394, pl. 68, fig. 23. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— **ovalis** (Sow.) Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 235. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **provida** n. s. Eichwald. (1871.)
Geog.-Paleont. Bemerk. Halbins. Mang. u. aleutischen, Inseln., pp. 131, 132. St. Petersburg, 1871. E. Eichwald.
Formation: Cretaceous.
Location: Unga and St. Paul islands, Alaska.

—— **ripleyana** n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858–1860, pp. 393, 394, pl. 68, fig. 22. Phila., 1858–1860. W. M. Gabb.
Formation: Cretaceous.
Location: Hardeman county, Tenn.

Venus—Continued.

—— **sublamellosus** n. s. Shumard. (1859.)
Trans. Acad. Sci., St. Louis, vol. 1, 1856–1860. pp. 598, 599. St. Louis, 1856–1860. B. F. Shumard.
Formation: Cretaceous.
Location: Grayson county, five miles north of Sherman, Tex.

—— **tetrahedra** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 163, pl. 30, fig. 247. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez, Cal.

—— **veatchii** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, p. 162, pl. 23, fig. 142. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Cal.

—— **(Mercenaria ?) varians** n. s. Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 161, 162, pl. 23, figs. 140, 140*a*, 141. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Near Martinez; Pence's ranch, Butte county; Tuscan springs, Tehama county, Cal.

—— (Linn.) Morton. (1829.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 122. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: Big Timber creek, Gloucester county, N. J.

—— ? (Linn.) Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 17, p. 286. New Haven, 1830. S. G. Morton.
Formation: Ferruginous sand [Cretaceous].
Location:

—— ? sp. undet. Roemer. (1849.)
Texas, p. 407. Bonn, 1849. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

—— (?) sp. undet. Roemer. (1852.)
Kreide. von Tex., p. 47. Bonn, 1852. F. Roemer.
Formation: Cretaceous.
Location: Fredericksburg, Tex.

Vermetus (Sow.) Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 197. Phila., 1827–1831. S. G. Morton.

—— **rotula** n. s. Morton. (1830.)
Jour. Acad. Nat. Sci., Phila., vol. 6, 1st ser., 1827–1831, p. 197. Phila., 1827–1831. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

—— **rotula** Morton. (1830.)
Am. Jour. Sci., 1st ser., vol. 18, pl. 3, fig. 18. New Haven, 1830. S. G. Morton.

—— **rotula** Morton. (1834.)
Synop. Org. Rem. Cret. Gr. U. S., pp. 81, 82, pl. 1, fig. 14. Phila., 1834. S. G. Morton.
Formation: Cretaceous.
Location: New Jersey.

Vermetus—Continued.

—— **(Serpula) sp. undet.** Hill. (1889.)

Geol. Sur. Texas, Bull. No. 4, p. 17. Austin, 1889. R. T. Hill.
Formation: Cretaceous.
Location: Texas.

Vetericardia (Con.) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, p. 127. Wash., 1885. R. P. Whitfield.

—— **crenulirata** (Lea) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 128, 129, pl. 18, figs. 5–7. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **octolirata** (Gabb) Whitfield. (1885.)

Mon. U. S. Geol. Sur., vol. 9, pp. 127, 128. Wash., 1885. R. P. Whitfield.
Formation: Cretaceous.
Location: New Jersey?

Vetocardia n. g. Conrad. (1868.)

Am. Jour. Conch., vol. 4, pp. 246, 247. Phila., 1868. T. A. Conrad.

—— **crenalirata** Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 43, pl. 1, fig. 23. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.
Location: Haddonfield, N. J.

—— **crenalirata** Conrad. (1869.)

Am. Jour. Conch., vol. 5, Phila., 1869, 1870, p. 48. Phila., 1870. T. A. Conrad.
Formation: Cretaceous.

Vitrina (Drapernaud) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 544, 545. Wash., 1876. F. B. Meek.

—— **obliqua** n. s. M. & H. (1857.)

Proc. Acad. Nat. Sci., Phila., for 1858, p. 134. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Mouth of Judith river, Nebr.

—— **obliqua** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 545, pl. 42, figs. 10*a*, *b*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Mouth of Judith river.

—— ? **obliqua** (M. & H.) White. (1883.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 87. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **obliqua** (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 452, pl. 27, figs. 32, 33. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Vivipara cossatotensis n. s. Hill. (1888.)

Ann. Rep. Geol. Sur. Ark., for 1888, vol. 2, p. 130, pl. 3, figs 4, 4*a*, 5, 5*a*. Little Rock, 1888. R. T. Hill.
Formation: Cretaceous?
Location: Well near Chapel hill, Sevier county, Ark.

Viviparus (Montfort) M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 114, 115. Wash., 1865. Meek & Hayden.

—— **conradi** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 597, 598, pl. 42, figs. 15*a*–*d*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Mouth of Judith river, Mont.

—— **conradi** (M. & H.) Meek. (1877.)

Rep. Geol. Expl., Fortieth Parallel, vol. 4, pt. 1, pp. 178, 179, pl. 17, figs. 18, 18*a*. Wash., 1877. F. B. Meek.
Formation: Cretaceous.
Location: Mouth of Sulphur creek, on Bear river, Wyo.

—— **conradi** (M. & H.) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Mouth of Judith river, Mont.

—— **conradi** (M. & H.) White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, figs. 4–6. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **conradi** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 76. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, six miles below the mouth of the Bow river; south side of Milk river, one mile above the mouth of Pă-kow-ki coulée; South Saskatchewan, one mile below the mouth of the Bow river, Canada.

—— **couesi** n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 717, 718. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Valley of Bear river, seven miles northwestward from Evanston, Wyo., and at several points in the vicinity of Mellis station, Union Pacific railroad, near the confluence of Sulphur creek and Bear river.

—— **cousei** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 245. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear river valley, Wyo.

—— **couesi** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 99, pl. 30, fig. 1*a*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Valley of Bear river, seven miles northward from Evanston, Wyo., and also near the mouth of Sulphur creek, above Evanston.

—— **couesii** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 8, fig. 1. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southwestern Wyoming and adjacent parts of Utah.

Viviparus—Continued.

—— gilli n. s. M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 115, pl. 5, figs. 3, *a*, *b*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of Black hills.

—— gilli (M. &. H.) White. (1886.)
Bull. U. S. Geol. Sur., No. 29, p. 23, pl. 4, fig. 17. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Black hills of Dakota.

—— gillianus (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 466, pl. 3, fig. 8. Wash., 1883. C. A. White.
Formation: Jurassic.
Location: Near the Black hills.

—— leai (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 577, 578, pl. 44, figs. 6*a–d*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Three miles below Fort Clarke, [N.] Dak.

—— leai (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— leai (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 27, figs. 10–14. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Crow creek valley, east of the Rocky mountains, in Colorado.

—— leai (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 24. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Bow river, four miles west of Blackfoot crossing; St. Mary river, at Gooseberry canyon, and three miles north of the forty-ninth parallel; Old Man river, two miles above Rye-grass flat; Belly river, twenty-three miles above the mouth of the Waterton; Pincher creek; Blind Man river, near fifth principal meridian, Canada.

—— leai (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 28. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Souris river, four miles east of Roche Percée; Short creek, Souris river, Canada.

—— leidyi (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 582, 583, pl. 44, fig. 4. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Ten miles below Fort Union, Dak., and near the mouth of Powder river, on the Yellowstone, in Montana.

—— leidyi (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Viviparus—Continued.

—— leidyi (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, fig. 7. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— leidyi var. formosus n. var. Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 583, pl. 44, figs. 3*a*, *b*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Ten miles below Fort Union, Dak., and near the mouth of Powder river, on the Yellowstone, in Montana.

—— leidyi var. formosus (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, figs. 8, 9. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— panguitchensis n. s. White. (1876.)
Rep. Geol. Uinta Mts., pp. 123, 124. Wash., 1876. C. A. White.
Formation: Cretaceous.
Location: [Southern Utah.]

—— panguitchensis White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 25, figs. 19-21. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Southern Utah.

—— peculiaris (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 580, fig. 79. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Fort Clarke, [N.] Dak.

—— peculiaris (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri region.

—— peculiaris (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, figs. 23, 24. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— plicapressus n. s. White. (1876.)
Rep. Geol. Uinta Mts., p. 133. Wash., 1876. C. A. White.
Formation: Tertiary [Cretaceous].
Location: Black buttes, Wyo.

—— plicapressus White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pp. 209, 210. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley, near Canyon park, Colo.

—— plicapressus White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 221. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo., and Yampa valley, near Canyon park, Colo.

Viviparus—Continued.

—— **plicapressus** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p, 98, pl. 28, figs. 3*a*, *b*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Black Buttes station, Wyo.

—— **plicapressus** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, figs. 25, 26. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— **prudentia** n. s. White. (1878.)
Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 716, 717. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Crow creek, Colo., ten miles above its confluence with South Platte river, northern Colorado.

—— **prudentia** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 172. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colo.

—— **prudentius** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 98, 99, pl. 28, figs. 5*ab*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, ten miles above the confluence of that creek with Platte river, northern Colorado.

—— **prudentius** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 25, figs. 17-18. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— **prudentius** (White) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 24. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Gooseberry canyon, St. Mary river, Pincher creek, Canada.

—— **raynoldsanus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 584, 585, pl. 44, figs. 7*a*, *b*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous.]
Location: Clear fork of Powder river, Mont., lower fork of same stream.

—— **retusus** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 578, 579, pl. 44, figs. 5*a*-*f*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Three miles below Fort Clarke, [N.] Dak.

—— **retusus** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

Viviparus—Continued.

—— **retusus** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, figs. 1-3. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: [Three miles below Fort Clarke, [N.] Dak.]

—— **reynoldsianus** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **reynoldsianus** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 25, figs. 22, 23. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— **trochiformis** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 580-582, pl. 44, figs. 2*a*-*e*. Wash., 1876. F. B. Meek.
Formation: [Cretaceous].
Location: Ten miles below Fort Union, Mont.; also one hundred and fifty miles below Fort Union.

—— **trochiformis** (M. & H.) White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 100. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Upper Missouri river region.

—— **trochiformis** (M. & H.) White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 467, pl. 24, figs. 10-16. Wash., 1883. C. A. White.
Formation: Cretaceous.

—— **trochiformis** (M. & H.) Whiteaves. (1885.)
Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 28. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Souris river, four miles east of Roche Percée and Great Valley, about one hundred miles west of Wood End depot, on the forty-ninth parallel, Canada.

Volsella (Scopoli) M. & H. (1865.)
Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 85, 86. Wash., 1865. Meek & Hayden.

—— (Scopoli) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 70. Wash., 1876. F. B. Meek.

—— **attenuata** (M. & H.) Meek. (1876.)
Rep. U. S. Geol. Sur. Terr., vol. 9, p. 74, pl. 28, figs. 8*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river.

Volsella—Continued.

—— **formosa** M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, pp. 86, 87, figs. A and B text. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Big Horn mountains, Dak.

—— **galpiniana** (E. & S.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 73, pl. 28, figs. 7*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Long lake, and on Moreau river.

—— **meekii** (E. & S.) Meek. (1876.)

Rep, U. S. Geol. Sur. Terr., vol. 9, p. 72, pl. 15, figs. 3*a*–*c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: On the Yellowstone river.

—— **pertenuis** M. & H. (1865.)

Paleont. Up. Missouri, Smithson. Cont. Knowl., vol. 14, No. 172, p. 86, pl. 3, figs. 5, 5*a*. Wash., 1865. Meek & Hayden.
Formation: Jurassic.
Location: Southwest base of the Black hills.

—— **pertenuis** (M. & H.) Whitfield. (1880.)

Rep. Geol. Black Hills of Dak., pp. 362, 363, pl. 5, figs. 13, 14. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: East side of Spearfish creek, near its junction with the Redwater, Black hills.

—— **scalprum** var. **isonema** n. var. Meek. (1877.)

Rep. Geol. Expl. Fortieth Parallel, vol. 4, pt. 1, pp. 132, 133, pl. 12, figs. 4, 4*a*. Wash., 1877. F. B. Meek.
Formation: Jurassic.
Location: Weber canyon, Wasatch range, Utah.

—— **subimbricata** (Meek) White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 145, 146, pl. 37, figs. 2*a*–*c*. Wash., 1880. C. A. White.
Formation: Jurassic.
Location: Near the lower canyon of the Yellowstone river and at Spring canyon, in Montana, and near Vermillion canyon, northwestern Colorado.

—— (**Brachydontes**) **laticostata** n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, p. 708. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, near White River Indian agency, Colorado.

—— (**Brachydontes**) **laticostata** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur., Terr., p. 212. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colo.

Volsella—Continued.

—— (**Brachydontes**) **laticostata** White. (1880.)

Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, p. 59, pl. 25, fig. 4*a*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, near White River Indian agency, northwestern Colorado.

—— (**Brachydontes**) **laticostata** White. (1883.)

Third Ann. Rep. U. S. Geol. Sur., p. 423, pl. 13, fig. 2. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Wyoming and Colorado.

—— (**Brachydontes**) **multilinigera** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 249. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Hilliard station, Wyo.

—— (**Brachydontes**) **multilinigera** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 248. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyo.

—— (**Brachydontes**) **multilinigera** (Meek) White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 235. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Coalville, Utah.

—— (**Brachydontes**) **regularis** n. s. White. (1878.)

Bull. U. S. Geol. and Geogr. Sur. Terr., vol. 4, No. 3, pp. 707, 708. Wash., 1878. C. A. White.
Formation: Cretaceous.
Location: The type specimen is from the valley of Crow creek, northern Colorado, fifteen miles above the confluence of that creek with South Platte river. Other examples are from Canyon park, valley of Yampa river; Danforth hills, near White River Indian agency; and Rock Springs station, Union Pacific railroad, Wyo.

—— (**Brachydontes**) **regularis** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 168. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Crow Creek valley, Colo.

—— (**Brachydontes**) **regularis** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 208. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Yampa valley, near Canyon park, Colo.

—— (**Brachydontes**) **regularis** White. (1879.)

Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 212. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Danforth hills, Colo.

Volsella—Continued.

—— **(Brachydontes) regularis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 215. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Rock springs, Wyo.

—— **(Brachydontes) regularis** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 218. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Rock springs, Wyo.; Crow Creek valley.

—— **(Brachydontes) regularis** White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 58, 59, pl. 25, figs. 3*a*. Wash., 1880. C. A. White.
Formation: Cretaceous.
Location: Valley of Crow creek, northern Colorado, about fifteen miles above the confluence of that creek with Platte river. Other examples are from Canyon park, valley of Yampa river; Danforth hills, near White River Indian agency, northwestern Colorado; and Rock Springs station, Union Pacific railroad, in the valley of Better creek, Wyo.

—— **(Brachydontes) regularis** White. (1883.)
Third Ann. Rep. U. S. Geol. Sur., p. 423, pl. 13, fig. 1. Wash., 1883. C. A. White.
Formation: Cretaceous.
Location: Wyoming and Colorado.

—— **(Modiola) formosa** (M. & H.) Whitfield. (1880.)
Rep. Geol. Black Hills of Dak., pp. 361, 362, pl. 6, fig. 15. Wash., 1880. R. P. Whitfield.
Formation: Jurassic.
Location: Near Big Horn mountains.

—— **(Modiolina) platynota** n. s. White. (1880.)
Twelfth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., pt. 1, pp. 146, 147, pl. 37, figs. 3*a*, *b*. Wash., 1880. C. A. White.
Formation: Jurassic.
Location: Head of Lincoln valley, southeastern Idaho.

—— **sp. undet.** White. (1879.)
Eleventh Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 242. Wash., 1879. C. A. White.
Formation: Cretaceous.
Location: Bear River valley, Wyo.

Voluta (Linn) Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 322. Phila., 1862. W. M. Gabb.

—— **cancellata** n. s. Tuomey. (1854.)
Proc. Acad. Nat. Sci., Phila., vol. 7, p. 169. Phila., 1856. M. Tuomey.
Formation: Cretaceous.
Location: Noxubie county, Mississippi.

Voluta—Continued.

—— **(Fasciolaria ?) delawarensis** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, pp. 322, 323. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal.

—— **fusiformis** n. s. Tuomey. (1854.)
Proc. Acad. Nat. Sci., Phila., vol. 7, p. 169. Phila., 1856. M. Tuomey.
Formation: Cretaceous.
Location: [Mississippi or Alabama?]

—— **jugosa** n. s. Tuomey. (1854.)
Proc. Acad. Nat. Sci., Phila., vol. 7, p. 169. Phila., 1856. M. Tuomey.
Formation: Cretaceous.
Location: Noxubie county, Mississippi.

—— **kanei** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 323. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— **mucronata** n. s. Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 323. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— **spillmanii** n. s. Tuomey.
Proc. Acad. Nat. Sci., Phila., vol. 7, p. 169. Phila., 1856. M. Tuomey.
Formation: Cretaceous.
Location: Columbus, Mississippi.

—— **sp. undet.** Forbes. (1844.)
Quart. Jour. Geol. Soc., London, vol. 1, p. 63, figs. *a–c*. London, 1845. Edward Forbes.
Formation: Cretaceous.
Location: New Jersey.

—— **sp. undet.** Credner. (1870.)
Zeitsch. Deutsch. Geol. Ges., Band 22, p. 237. Berlin, 1870. H. Credner.
Formation: Cretaceous.
Location: New Jersey.

Volutat[l]ithes (Swains.) Conrad. (1855.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean; App. Prelim. Geol. Rep. of W. P. Blake, Pal. p. 11. Wash., 1855. T. A. Conrad.

—— **[l]ithes californiana** n. s. Conrad. (1855.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean; App. Prelim. Geol. Rep. of W. P. Blake, Pal. p. 11. Wash., 1855. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada de las Uvas.

—— **[l]ithes californiana** Conrad. (1856.)
Rep. Expl. and Sur. R. R. R. Miss. River to Pacific Ocean, vol. 5; App. p. 322, pl. 2, fig. 9. Wash., 1856. T. A. Conrad.
Formation: Eocene [Cretaceous].
Location: Cañada de las Uvas.

Volutilithes (Swainson) Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 333. Phila., 1855-1858. T. A. Conrad.

——abbotti n. s. Gabb. (1860.)
Proc. Acad. Nat. Sci., Phila., for 1860, p. 94, pl. 2, fig. 7. Phila., 1861. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— bella n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 300, pl. 48 fig. 7. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Delaware and Chesapeake canal.

—— biplicata n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 300, pl. 48, fig. 6. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Burlington county, N. J.

—— conradi n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, pp. 300, 301, pl. 48, fig. 10. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Crosswicks, N. J.

—— conradi Gabb. (1861.)
Proc. Acad. Nat. Sci., Phila., for 1861, p. 364. Phila., 1862. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— cretacea n. s. Conrad. (1858.)
Jour. Acad. Nat. Sci., Phila., vol. 3, 2d ser., 1855-1858, p. 333, pl. 35, fig. 16. Phila., 1855-1858. T. A. Conrad.
Formation: Cretaceous.
Location: Owl creek, three miles north of the town of Ripley, Miss.

—— eufaulensis n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, pp. 286, 287, pl. 47, fig. 18. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Eufaula, Ala.

—— nasuta n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser., 1858-1860, p. 300, pl. 48, fig. 9. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Monmouth county, N. J.

——navarroensis n. s. Shumard. (1861.)
Proc. Boston Soc. Nat. Hist., vol. 8, 1861, 1862, p. 192. Boston, 1862. B. F. Shumard.
Formation: Cretaceous.
Location: Near Corsicana, Navarro county, Tex.

——navarroensis (Shum.) Gabb. (1864.)
Geol. Sur. Cal. Paleont., vol. 1, pp. 102, 103, pl. 19, fig. 56. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Tuscan springs, Pence's ranch, above Oroville, Butte county; Jacksonville, Oregon; Siskiyou mountains; Chico creek; Cow creek, Shasta county, Cal.

Volutilithes—Continued.

—— saffordi n. s. Gabb. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser. 1858-1860, p. 300, pl. 48, fig. 8. Phila., 1858-1860. W. M. Gabb.
Formation: Cretaceous.
Location: Tennessee.

—— (Athleta) leioderma n. s. Conrad. (1860.)
Jour. Acad. Nat. Sci., Phila., vol. 4, 2d ser. 1858-1860, p. 292, pl. 46, fig. 32. Phila., 1858-1860. T. A. Conrad.
Formation: Cretaceous.
Location: Tippah county, Miss.

Volutoderma n. g. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 289. Phila., 1876. W. M. Gabb.

—— ? biplicata Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 292. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— sp. undet. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 292. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: Vincentown, N. J.

Volutomorpha n. g. Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 290. Phila., 1876. W. M. Gabb.

—— (Gabb) Dall. (1890.)
Trans. Wag. Free. Inst. Sci., Phila., vol. 3, p. 73. Phila., 1890. W. H. Dall.

—— abbotti Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 293. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— bella Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 293. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— conradi Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 293. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.
Location: New Jersey.

—— conradi (Gabb) Dall. (1890.)
Trans. Wag. Free. Inst. Sci., Phila., vol. 3, p. 73. Phila., 1890. W. H. Dall.
Formation: Cretaceous.
Location: New Jersey.

—— kanei Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 293. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

—— mucronata Gabb. (1876.)
Proc. Acad. Nat. Sci., Phila., for 1876, p. 293. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

Volutomorpha—Continued.

—— **saffordi** Gabb. (1876.)

Proc. Acad. Nat. Sci., Phila., for 1876, p. 293. Phila., 1876. W. M. Gabb.
Formation: Cretaceous.

Volviceramus (subgen. Stoliczka) **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 40. Wash., 1876. F. B. Meek.

—— **exogyroides** (**M. & H.**) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Con., Cont. Can. Paleont., vol. 1, pt. 1, p. 84. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South branch of Drywood fork, Waterton river; entrance to North Kootanie pass, Canada.

Vorticifex (Meek) White. (1886.)

Bull. U. S. Geol. Sur., No. 29, p. 21. Wash., 1886. C. A. White.

—— **stearnsii** n. s. White. (1886.)

Bull. U. S. Geol. Sur., No. 29, pp. 21, 22, pl. 4, figs. 4–7. Wash., 1886. C. A. White.
Formation: Jurassic.
Location: Como, Wyo.

Websteria (**Edwards & Haime**) **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 2, 3. Wash., 1876. F. B. Meek.

—— **cretacea** n. s. **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, pp. 3, 4, pl. 28, figs. 3*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: South branch of Cheyenne river, near Black hills.

Whitneya n. g. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, pp. 103, 104. Phila., 1864. W. M. Gabb.

—— **ficus** n. s. Gabb. (1864.)

Geol. Sur. Cal. Paleont., vol. 1, p. 104, pl. 28, fig. 216. Phila., 1864. W. M. Gabb.
Formation: Cretaceous.
Location: Fort Tejon, Cal.

Xylophaga elegantula n. s. **M. & H.** (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, p. 141. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Muscle Shell river, Nebr.

—— **stimpsoni** n. s. **M. & H.** (1857.)

Proc. Acad. Nat. Sci., Phila., for 1857, pp. 141, 142. Phila., 1858. Meek & Hayden.
Formation: Cretaceous.
Location: Muscle Shell river, Nebr.

Xylophagella n. g. **Meek.** (1864.)

Check List Invert. Foss. N. Am. Cret. and Jur., Smithson. Misc. Coll., vol. 7, No. 177, p. 34. Wash., 1864. F. B. Meek.

—— subgen. **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 255. Wash., 1876. F. B. Meek.

Xylophagella—Continued.

—— **elegantula** (**M. & H.**) **Meek.** (1864.)

Check List Invert. Foss. N. Am. Cret. and Jur. Smithson. Misc. Coll., vol. 7, No. 177, p. 34. Wash., 1864. F. B. Meek.
Formation: Cretaceous.
Location: Dakota.

Yoldia (Mörch.) Conrad. (1867.)

Am. Jour. Conch., vol. 3, p. 8. Phila., 1867. T. A. Conrad.

—— (Möller) **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 107. Wash., 1876. F. B. Meek.

—— **albaria** n. s. Conrad. (1867.)

Am. Jour. Conch., vol. 3, p. 8. Phila., 1867. T. A. Conrad.
Formation: Cretaceous.

—— **arata** n. s. Whiteaves. (1884.)

Geol. and Nat. Hist. Sur. Can., Mes. Foss., vol. 1, pt. 3, p. 233, pl. 31, figs. 4, 4*a*. Montreal, 1884. J. F. Whiteaves.
Formation: Cretaceous.
Location: South island, Skidegate inlet; Bear Skin bay, Skidegate inlet; Cumshewa inlet.

—— **arata** Whiteaves. (1887.)

Geol. and Nat. Hist. Sur. Can., vol. 2, n. ser., 1886, App. I, p. 112 B. Montreal, 1887. J. F. Whiteaves.
Formation: Cretaceous.
Location: East side of Winter harbor, Forward inlet.

—— **arata** Whiteaves. (1889.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 2, p. 154. Montreal, 1889. J. F. Whiteaves.
Formation: Cretaceous.
Location: East side of Winter harbor, Forward inlet, Canada.

—— **eufalensis** (Gabb) **Conrad.** (1870.)

Am. Jour. Conch., vol. 6, Phila., 1870, 1871, p. 74. Phila., 1871. T. A. Conrad.
Formation: Cretaceous.

—— **evansi** (**M. & H.**) **Meek.** (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 111, pl. 28, figs. 10*a–c*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river; on the Yellowstone river; also on Milk river.

—— **evansi** (**M. & H.**) **Whitfield.** (1880.)

Rep. Geol. Black Hills of Dak., p. 409, pl. 11, figs. 1, 2. Wash., 1880. R. P. Whitfield.
Formation: Cretaceous.
Location: On Old Woman fork of the Cheyenne river, and near Rapid creek, Black hills.

—— **evansi** (**M. & H.**) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 38. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: South Saskatchewan, fifteen miles west of the mouth of Swift Current creek; Old Wives creek, township 10, range 11, west of third principal meridian, Canada.

Yoldia—Continued.

—— **microdonta** n. s. Meek. (1871.)

Fourth Ann. Rep. U. S. Geol. and Geogr. Sur. Terr., p. 304. Wash., 1871. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

—— **microdonta** Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 109, pl. 2, fig. 2. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Twelve miles southwest of Salina, Kans.

—— **scitula** (M. & H.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 110, pl. 28, fig. 9. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: Moreau river and Long lake.

—— **scitula** (M. & H.) Whiteaves. (1885.)

Geol. and Nat. Hist. Sur. Can., Cont. Can. Paleont., vol. 1, pt. 1, p. 38, pl. 5, fig. 2. Montreal, 1885. J. F. Whiteaves.
Formation: Cretaceous.
Location: Twelve miles east of White Mud river, on trail to Woody mountain, and forty-ninth parallel, on the east branch of the Poplar river, Canada.

—— **striatula** (Forbes) Whiteaves. (1879.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 2, p. 162, pl. 18, fig. 9. Montreal, 1879. J. F. Whiteaves.
Formation: Cretaceous.
Location: Northwest side of Hornby island; southwest side of Denman island; Sucia islands.

Yoldia—Continued.

—— **ventricosa** (H. & M.) Meek. (1876.)

Rep. U. S. Geol. Sur. Terr., vol. 9, p. 112, pl. 15, figs. 5*a*, *b*. Wash., 1876. F. B. Meek.
Formation: Cretaceous.
Location: South fork of Cheyenne, river.

—— sp. undet. Whiteaves. (1876.)

Geol. Sur. Can., Mes. Foss., vol. 1, pt. 1, pp., 72, 73. Montreal, 1876. J. F. Whiteaves.
Formation: Cretaceous.
Location: Queen Charlotte islands.

—— sp. undet. Whiteaves. (1878.)

Canadian Naturalist, vol. 8, n. ser., No. 7, pp. 404, 405. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic:
Location: Iltasyouco river.

—— sp. undet. Whiteaves. (1882.)

Proc. and Trans. Roy. Soc., Canada, vol. 1, sec. 4, p. 85. Montreal, 1883. J. F. Whiteaves.
Formation: Cretaceous.
Location: Skagit river, Canada.

—— (or **Corbis**) sp. undet. Whiteaves. (1878.)

Geol. Sur. Can., Rep. Prog. for 1876, 1877, p. 154. Montreal, 1878. J. F. Whiteaves.
Formation: Jurassic:
Location; Iltasyouco river, British Columbia.

Zirphæa (Leach) White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 15. Wash., 1889. C. A. White.

—— **plana** n. s. White. (1889.)

Bull. U. S. Geol. Sur., No. 51, p. 15, pl. 4, fig. 22. Wash., 1889. C. A. White.
Formation: Cretaceous.
Location: Martinez, Contra Costa county, Cal.